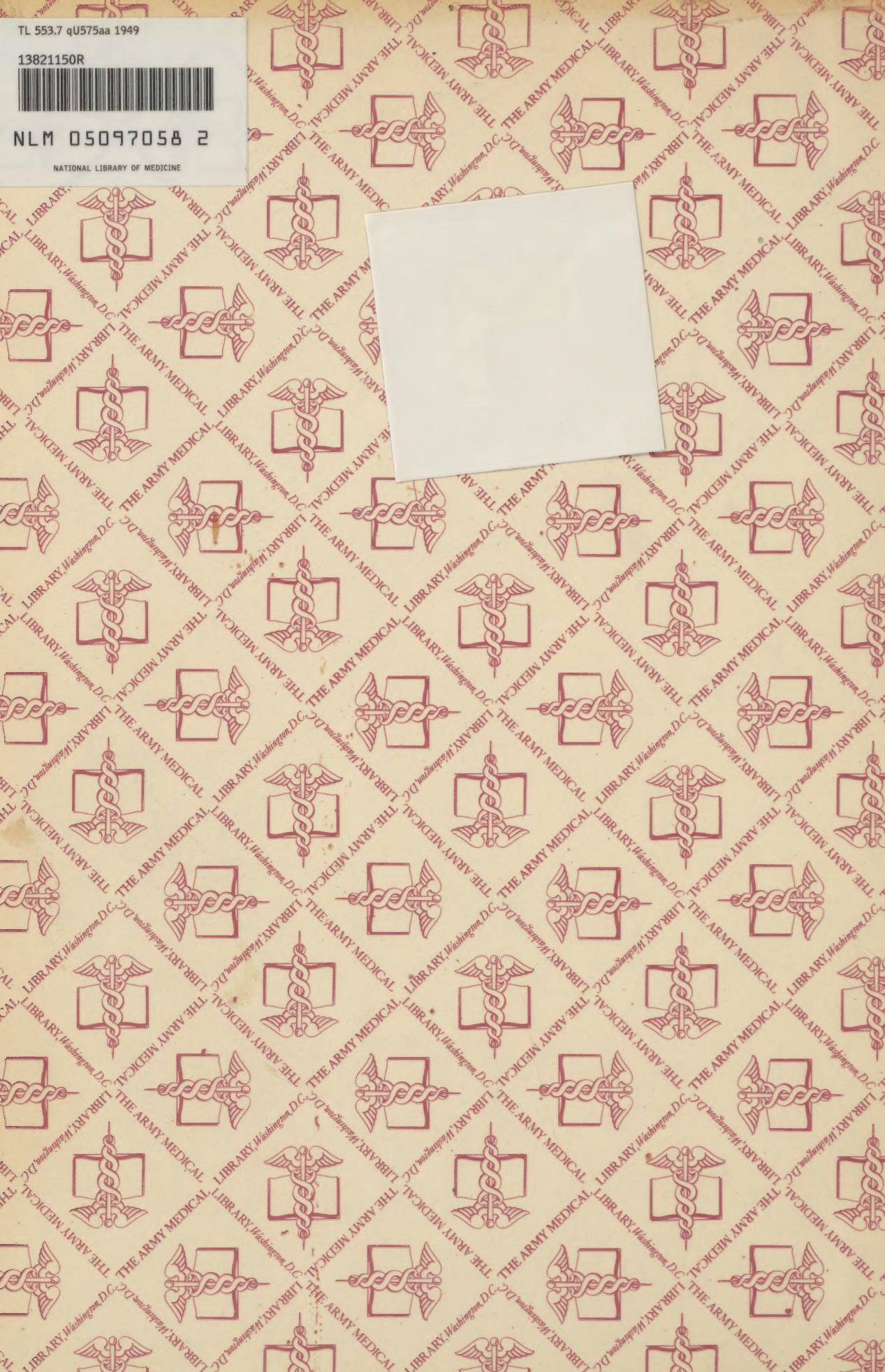


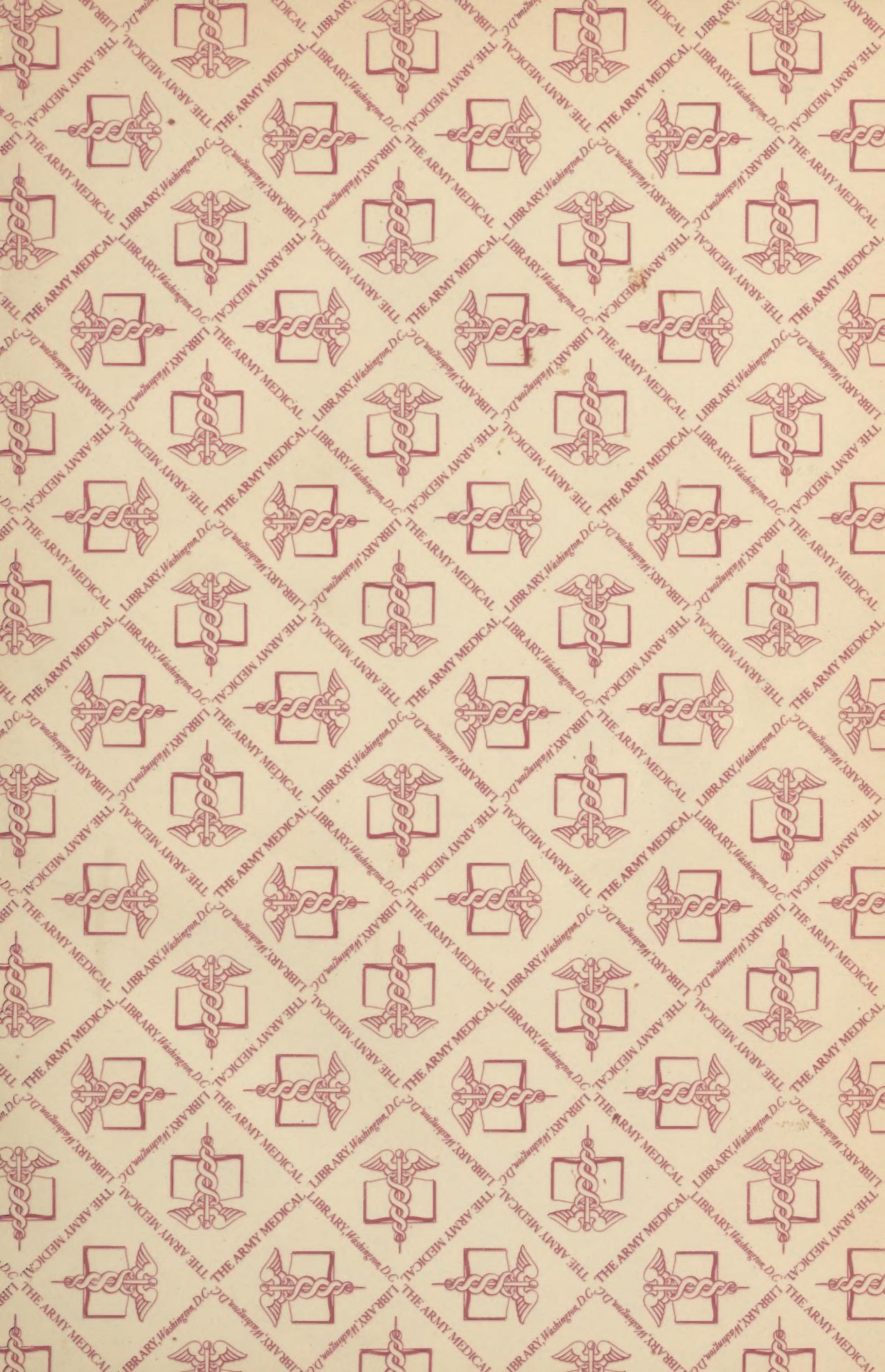




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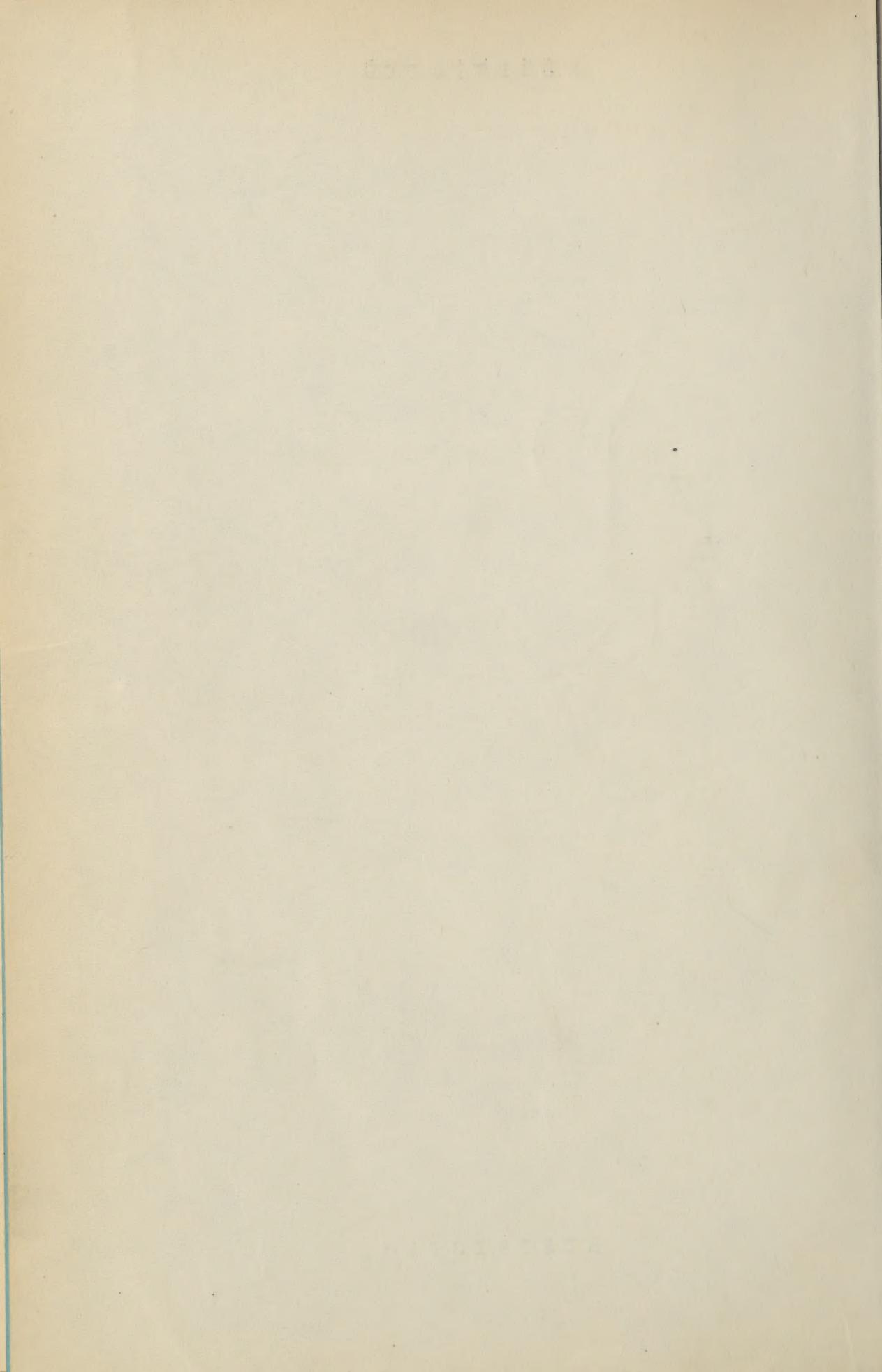
ALASKAN AREA



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AIR UNIVERSITY DOCUMENTARY RESEARCH STUDY

ARCTIC SURVIVAL AND RESCUE REPORTS

ALASKAN AREA

Compiled by
ORON P. SOUTH, M.S.

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DOCUMENTARY RESEARCH DIVISION
AIR UNIVERSITY
MAXWELL AIR FORCE BASE, ALABAMA

March 1949

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PART CNE

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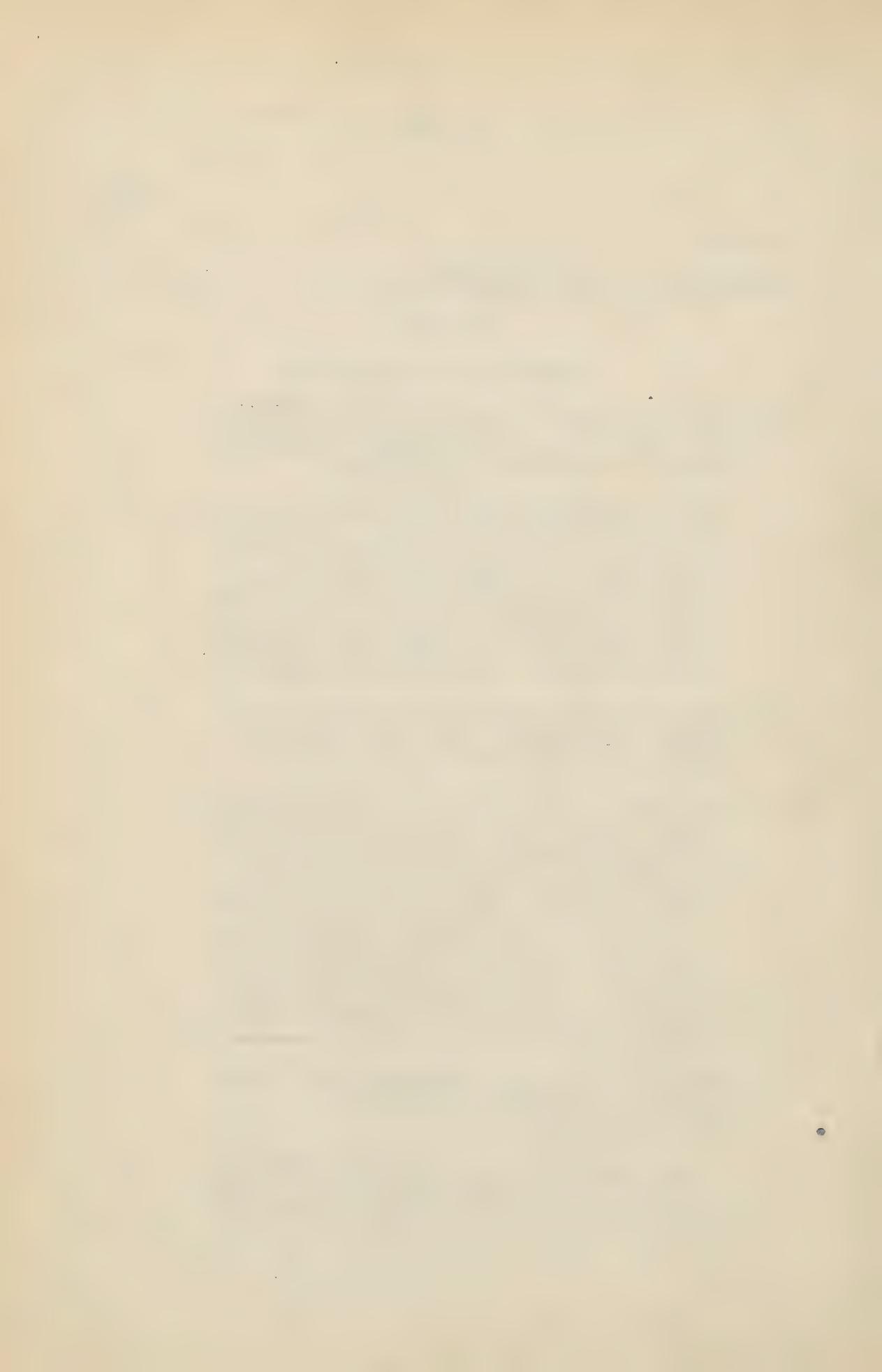
This is probably one of the best known survival stories of war-time Alaska. Crane parachuted from a B-24 on 21 December 1943. He could find none of the other crew members after landing and for eight or nine days wandered around looking for food and shelter. Eighty-four days after taking off from Ladd Field he returned in good physical condition. .

2. "Search And Rescue Squadron Activities." From Alaskan Division ATC, "Historical Reports," Fairbanks Air Base, Feb-June 1944.

An account of the search in the area where Lt. Crane landed. This was made after Lt. Crane returned to Fairbanks, but it did indicate that Crane was suffering from considerable shock initially. The plane which he thought landed ten miles away turned out to be only a few hundred yards distant. The SOS signal which Crane said he had laid out could not be found. This article summarizes the findings of the group which surveyed the site several months later.

3. Fritz, Milo H., M.D. "Ambulance Case On Mount Redoubt." The Saturday Evening Post, p 14, 2 Oct 1943.

The story of the rescue operation which removed an injured flyer from the Lake Iliamna region in June 1942. An excellent example of



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the trouble which may be encountered by a poorly conceived rescue effort.	8
This same story in a slightly more lengthy version with additional comments by Major Fritz can be found in "Arctic Training School," 62-72, ADT 4591.	
4. "Experience of Two Men Forced Down in Alaska." From "Arctic Training School," 73-81, ADT 4591.	
The narrative of Sgt Richard L. Pompeo who was forced down with Col H. H. Carr, 17 January 1942. Both men had included emergency supplies in the plane load so that they suffered comparatively little from 14 days in the bush. .	20
5. Sutton, George M., Maj AC. "Land Rescue Problems Of The Eleventh Air Force."	
Report on trip to the Aleutians and the Mt. Pavlof accident, 18 March 1945.	28
6. Weston, John, Capt MC. "Then I Jumped." The Saturday Evening Post, p 22+, 25 August 1945.	
The story of a ground forces medic who volunteered to jump to the aid of the survivors of a C-47 which crashed on Mt. Pavlof, 18 March 1945.	39
7. Sutton, George M., Maj AC, "Notes On Land and Seashore Survival In Alaska And On The Aleutians." 13 April 1945.	
Report on trip by member of the Arctic, Desert, Tropic Branch, AAESAT, dealing chiefly with living off the land.	49
8. "Report of M and K Rescue Trip." 15 June 1944.	
Rescue account of 2nd Arctic Search and Rescue Squadron which picked up three survivors from a Spartan which crashed southwest of Northway. .	57
9. "Search From Galena." March 1945. From Alaskan Division, ATC, "Historical Record Report," November 1944-September 1945.	

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The story of a civilian pilot who took off without clearance or briefing, and then criticized Search and Rescue for not finding him even though he had never established radio contact. . .	60
10. "Report of Operations." 26 September 1944. From Alaskan Division, ATC, "Historical Record Report," September-October 1944, Appendix.	
Search for C-47 which crashed on northeast slope of Mt. McKinley. Includes several comments on equipment and procedures.	62
11. Sharp, Robert P., Capt AC. "Survival Incidents." From "Supplementary Report of Detached Service In Canada, Alaska And The Aleutians." 3 May 1944.	
Comments on survival equipment used on Alaskan run with 1/4 survival stories in condensed versions.	67
12. Haney, David J., 1st Lt AC. "The Kee Bird Flight." From "Navigation North Of Seventy." 58-72.	
Story of a B-29 from the 46th Pcn Sq (VLR) Photo which crashed in Greenland in 1947.	79
13. "Survival Under Arctic Winter Conditions." From, RCAF, Report On Winter Operations Winter Experimental Establishment Edmonton - Churchill Watson Lake 1947-48 Season. Vol. XVI, April 1948.	
Summary of chances for survival of crew forced down in winter months, with comments on RCAF clothing and equipment.	86

PART TWO

SURVIVAL INSTRUCTIONS

1. WHAT TO DO.

Survival manual published by Alaskan Wing, ATC, for use of passengers and crew.

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2. "Operating Instructions for the 578A Emergency Transmitter." 30 January 1944. From "Supplementary

Report of Detached Service in Canada, Alaska
And The Aleutians."

The Alaskan Wing, ATC, had considerable difficulty locating personnel who had Gibson Girl radios but who did not know how to get best results when the balloon could not be used. In one case several communication experts were downed with the radio and were unable to make it work because of lack of knowledge of the operations outlined in the memorandum.

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3. White, Bishop, Capt AC. The Route (of all evil)
Cr "So You Want To Go To Alaska." Illustrated
by Capt Lester H. Baker.

Survival manual for the 7th Ferrying Group
pilots who were taking planes from Great
Falls to Fairbanks.

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PART THREE

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1. "Emergency Equipment Placed In Fuselage Of AT-11 And UC-64 Aircraft." 29 June 1944.
From Alaskan Division, ATC, "Historical Reports Edmonton Air Base," May-June 1944.
 2. Alaskan Division Memorandum No. 62-4.
"Emergency Kits on Alaskan Wing Aircraft."
27 July 1944. From Alaskan Division, ATC,
"Historical Record Report," July 1944.
 3. Alaskan Division Memorandum No. 62-4.
"Emergency Kits On Alaskan Division Aircraft." 29 January 1945. From ALSD, ATC,
"Historical Record Report," November 1944
September 1945, Appendix.
 4. 72nd Reconnaissance Squadron (VLR) Photographic,
Office Of The Personal Equipment Officer, "Personal And Emergency Equipment." APO 731, c/o FM,
Seattle, Wash., 13 January 1949.
- List of equipment, personal and emergency, to
be carried on all aircraft.

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PREFACE

These reports have been collected primarily for the use of The Air University students and instructors interested in Arctic* survival and rescue problems. Selection has been determined by aptness, availability, classification, and length. No effort has been made to include all survival accounts but it is believed that the reports selected are representative of common situations and circumstances.

None of the episodes deal with survival on the Arctic Ice Pack. So far as is known no USAF planes have been forced down in the area north of Point Barrow. There are, however, several accounts of expeditions and individual flights which have been placed in circumstances similar to those which will confront USAF flyers forced down on pack ice. Perhaps the best short account of these can be found in Jeanette Mirsky's To The Arctic! (New York: Alfred A. Knopf, 1948). From this book ideas for more detailed reading may be gained.

No attempt has been made to comment on apparent errors made by various victims of forced landings. Since many Arctic experts cannot agree among themselves as to the best methods and equipment to be used on any given occasion, it was thought best to let each individual reader draw his own conclusions as

*The term Arctic is used somewhat loosely in this study which includes the Arctic, the Sub-Arctic, and the Aleutians.

to the wisdom of different actions.

For those who desire to pursue the subject further a list of suggested readings is included. This makes no claim to completeness but does present some of the better known works in the field.

SUGGESTIONS FOR FURTHER READING*

Air Proving Ground, Eglin Air Force Base, "Functional Test of 'Window' As An Arctic Radar Navigational Aid," Project No. E-47-20-CW, 2 April 1948. M-2741-10-S, No. E-47-20-CW.

Contains information concerning the feasibility of using window and corner reflectors for locating and re-locating personnel and aircraft in the snow. SECRET

Arctic, Desert, Tropic Information Center, "Classified List of Reference On Arctic Conditions," August 1943. M-20277-C.
CONFIDENTIAL

Contains references on Survival and Rescue.

, "Medical Conditions in Arctic Regions," Informational Bulletin Medical Series No. 1. M-27765-NC.

Discusses acclimatization to Arctic conditions, psychological factors which might keep a downed flier from sleeping properly from fear of freezing, clothing and proper fitting; effects of cold and methods of treatment of frozen and frostbitten members; snow blindness, and how to prevent it; sunburn; insects; sanitation and sewage disposal. All discussed from common sense point of view - nontechnical.

, "Nine School Lectures, The Arctic," (Three Lectures): Lecture III—Survival. M-7204-NC.

Deals primarily with survival in land areas, uses Greenland crack-up as an example of what can happen to an ignorant unprepared crew. Fairly general, and needs to be supplemented by more specific reading on how to make rabbit traps, lean-to, etc.

, "Survival: A Selected Bibliography," 1 Jan 1945.

Air Technical Service Command, "Alaskan Field Test of AAF Emergency and Survival Equipment," May 1945. M-25266-NC.

Balchen, Colonel Bernt, Major Corey Ford, and Major Oliver La Farge. War Below Zero, Foreword by General H. H. Arnold. Houghton Mifflin Co: Boston 1944. 940.542, Bl8w.

Discussion of conditions on Greenland during the war, with main story devoted to account of B-17 crash on icecap and attempts to rescue survivors. Interesting and instructive.

*M- and ACT- indicate accession numbers in The Air University Libraries.

Crane, L., "I Was Lost 84 Days In The Arctic," American Magazine, 138:32-33+, August 1944.

The most complete account of Crane's experiences after parachuting from a B-24 in Alaska.

Department of Mines and Resources, Mines and Geology Branch, "Emergency Food In Arctic Canada," Ottawa, 1945. ADT 5996.

"Discussion of Arctic Conditions by Dr. Vilhjalmur Stefansson (Special Consultant, Office Coordinator of Information) at a Conference Held at Headquarters Army Air Forces, Directorage of Weather, April 4, 1942." Washington, April 1942, Weather Research Center, Vol. IV, No. 1, p 21. M-17020.

Discusses possibility of living on ice floe for extended period of time without receiving supplies from outside.

Hanson, Earl Parker, Expert Consultant C.Q.M.G., "Reconnaissance Report on Concentrated Rations of Primitive Peoples," 10 November 1942. In ADT Administrative Files.

Considerable discussion of pemican as emergency and staple food.

Headquarters Alaskan Air Command, Operations Analysis Section, "Analysis of Events Preceding And Following The Crash Landing Of A B-29 On Seward Peninsula, Alaska, 23 December 1947," Report No. 2, March 1948. M-32539-R, No. 2.

Headquarters Strategic Air Command, Operations Analysis Section, "Outline of Polar Survival Procedures To Be Followed By VHB Crews After Crash Landing," Report No. 20, 22 Oct 1947. M-29779-NC, No. 20.

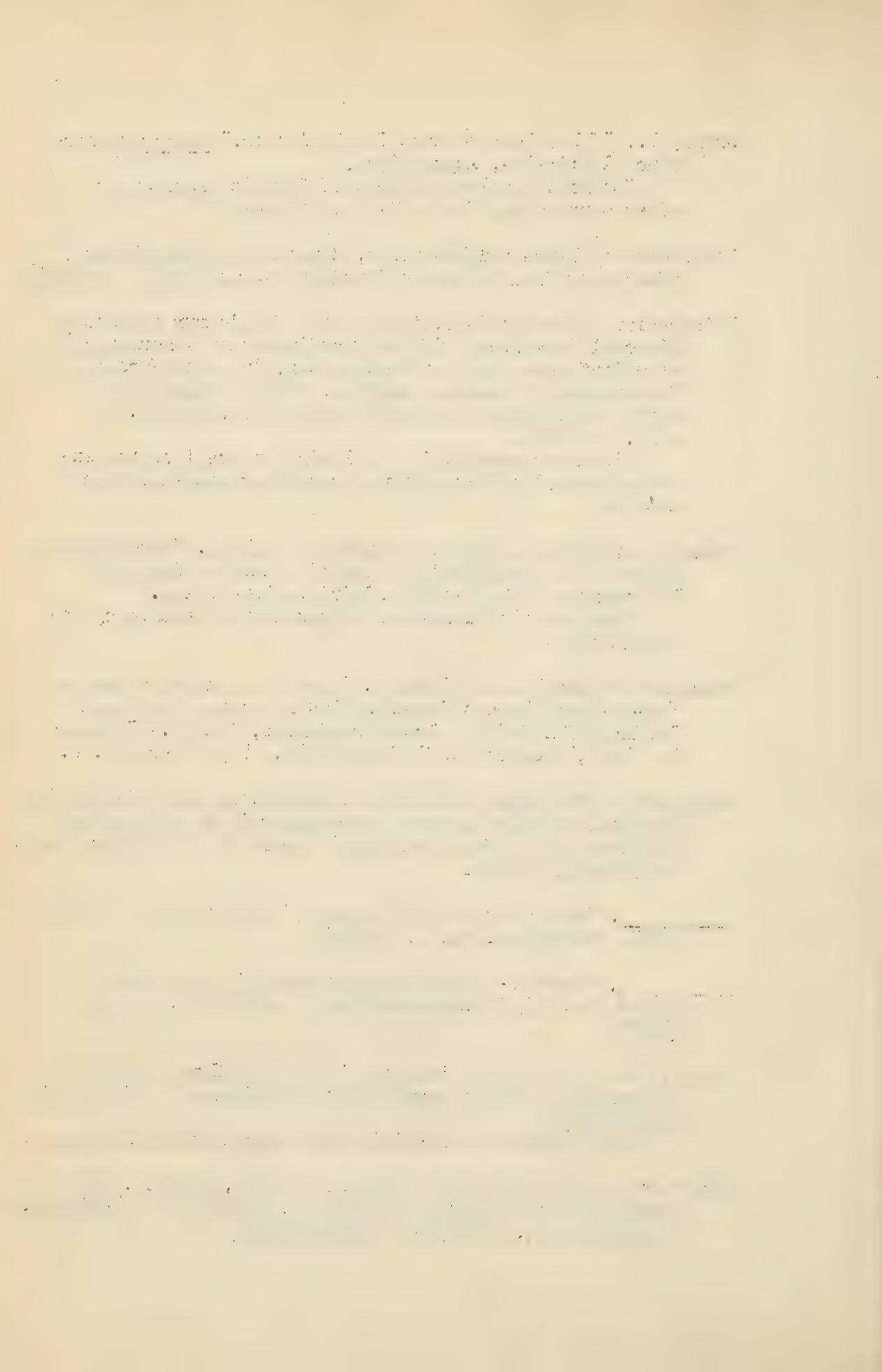
 , "Polar Survival and Rescue," Report No. 6, 17 Feb 1947. M-29779-S, No. 6. SECRET

 , "Three B-29 Airplane Accidents In The Arctic," Report No. 18, 15 September 1947. M-29779-S, No. 18. SECRET

Kelsey, Mavis P., Flight Surgeon, XI Fighter Command, "Rescue of Personnel Forced Down in Aleutian Waters." ADT 767-C. CONFIDENTIAL

 Case histories of pilots forced down in the Aleutians.

Report of the Army Air Forces Board, Orlando, Florida, "Cold Weather Test of Radio Set AN/CRT-3, "Project No. 42970413.44, 20 April 1945. M-6457-C. CONFIDENTIAL



Schmidt, Robert W. "Problems Affecting Construction of Air-
dromes in Arctic and Sub-Arctic Areas." Documentary
Research Study, The Air University Libraries, April
1949. SECRET

Stefansson, Vilhjalmur, "Life on the Polar Sea," Project
S-1, Section 10. The Stefansson Library, New York,
New York. ADT 2326.

_____, "Living Off the Country," Geographical Review,
7:291-310, May 1919.

Stefansson advocates living off the country as a
means of Arctic exploration. However, the method could
be equally well used by stranded personnel in need of
food.

USAF, Air Materiel Command, "Survival Ration, Alaskan Field
Trial," 1948. M-27897-7-NC.

_____, "Test Survey of Space Available For a Survival
Kit In Fighter Aircraft." MCREFL-670-21G. 16 August
1948. M-27897-7-NC, MCREFD-670-21G.

Wilkins, Sir Hubert, "Arctic Operations," AAFSAT Intelligence
Reports, No. 21, Jan 1944. M-10800-R.

Wilkins tells of his experience with falling into
water at 40 below zero. Also how 14 crew men of a Nor-
wegian sailing vessel fell into water and then swam 200
yards to an iceberg where they remained for two weeks,
subsisting almost entirely on penguins.

PART ONE - SURVIVAL AND RESCUE REPORTS

FIRST LT. CRANE'S ACCOUNT OF CRASH AND RESCUE¹

A Liberator bomber took off from this station about 9:40 A.M.,² just at dawn, on December 21, 1945 for the purpose of making tests. The plane was cruising at approximately 20,000 feet and in overcast. The crew decided to take the plane up to 25,000 feet. Trouble developed with the flight instruments and the plane went into a spin. At the same time one of the outboard engines failed. As soon as the plane came down out of the overcast it was pulled out of the spin but would go into a stall and then a spin again as the controls had become jammed. The pilot, Lt. Harold Hoskins, gave orders to bail out. Previous to that an order had been given to open the bomb bay doors and give the crash alarm. Centrifugal force made it very difficult to get out of the plane, but Lt. Crane saw one of the crew go out before he left the ship. The pilot was still in the ship when Lt. Crane jumped but thought that one other person left the plane about the same time. On the way down he saw a chute of one of the crew members above him, but that was the only chute he saw on the way down. The plane was at about 10,000 to 15,000 feet altitude when Lt. Crane jumped and he watched the plane as it fell in a spin noting that it apparently caught fire at about 5000 feet altitude and exploded when it hit the ground. Lt. Crane landed about ten miles from where the plane crashed with a ridge between him and the plane. Inasmuch as the terrain was bad between him and the place where the plane went down and that he had landed near a stream, he thought it best to follow the stream to get help. After laying out an SOS sign in the snow with spruce branches, he started out down stream in snow about knee deep with an underfooting of glacier ice. About half way down stream he hit the Charley River and followed that river until evening when he stopped and made a camp fire. The next morning he made another SOS sign with spruce boughs in the snow, hoping that possibly search planes might pass overhead. He stayed on the bank of the river at that location as it appeared to be a good spot since he could secure drinking water from an overflow in the ice. After eight or nine days from the date of the crash, he decided to continue downstream since he had not heard or

¹This version of 1st Lt. Crane's personal account was transcribed at Fairbanks and was included in the Fairbanks Air Base Monthly Historical Report, for March 1944.

²This Cold Weather Test plane was stationed at Ladd Field, Fairbanks.

seen any searching planes. He continued to put out SOS signs in the snow along the way. As Lt. Crane thought over the incidents pertaining to the crash he realized that they had not had time to give any location or position over their radio as events had happened too rapidly....also the throat microphone had been torn loose during the spin. He decided that the situation looked hopeless and started downstream again. After another day of travel he found a small cache with a small supply of food. He later found out that the cache belonged to a Mr. Berail, watchman for the Woodchopper Mining Camp. After he had found some food, drank some cocoa and rested, he decided that it was best to continue on downstream rather than go back to the wreck as probably no one knew the location of the crash. Putting some raisins in his pocket from the supply of food in the cache he set off downstream, and after traveling about one day and one night ran out of food. He noted that the stream didn't appear to get any wider or run into any valleys so turned around and went back to the cabin and remained there for about three weeks. He later found that he had missed two other cabins by traveling during the night. There was enough food in the cache so that he could have remained there until about the middle of April. The stock consisted of about twenty-five pounds of flour, thirty pounds of rice, the same amount of dried beef and beans, and a few cans of dried eggs, onions, and vegetables. The cabin was about nine by ten feet and about five foot high, made of logs. Lt. Crane did not attempt to keep a fire going all the time except for cooking purposes because fire wood was so hard to secure. He did not suffer very much from the cold except at the times he was on the trail as he had picked up a sleeping robe at one of the smaller cabins. After considering the possibility of remaining at this cabin until the spring breakup he finally decided to start on downstream with a "do or die" effort, and made a small sled to carry what supplies were left. About half way down the stream from the cabin to the mouth of the river he abandoned the sled and put the supplies on his back as he found another small cache of food at this point. After resting for two or three days he started on downstream and as he rounded a bend in the river one day he came upon some spruce boughs sticking up at regular intervals on the river with toboggan tracks leading away from it. He realized then that this was obviously a landing place for planes on the river, and backtracking where the toboggan tracks were, he came upon the cabin of Albert Ames. Ames, his wife and three children, took him in, gave him food, new muckluks and his first taste of moose meat. After remaining there two nights they supplied him with items needed (including a haircut by Mrs. Ames). Mr. Ames led the way toward Woodchopper with his dog team while Lt. Crane

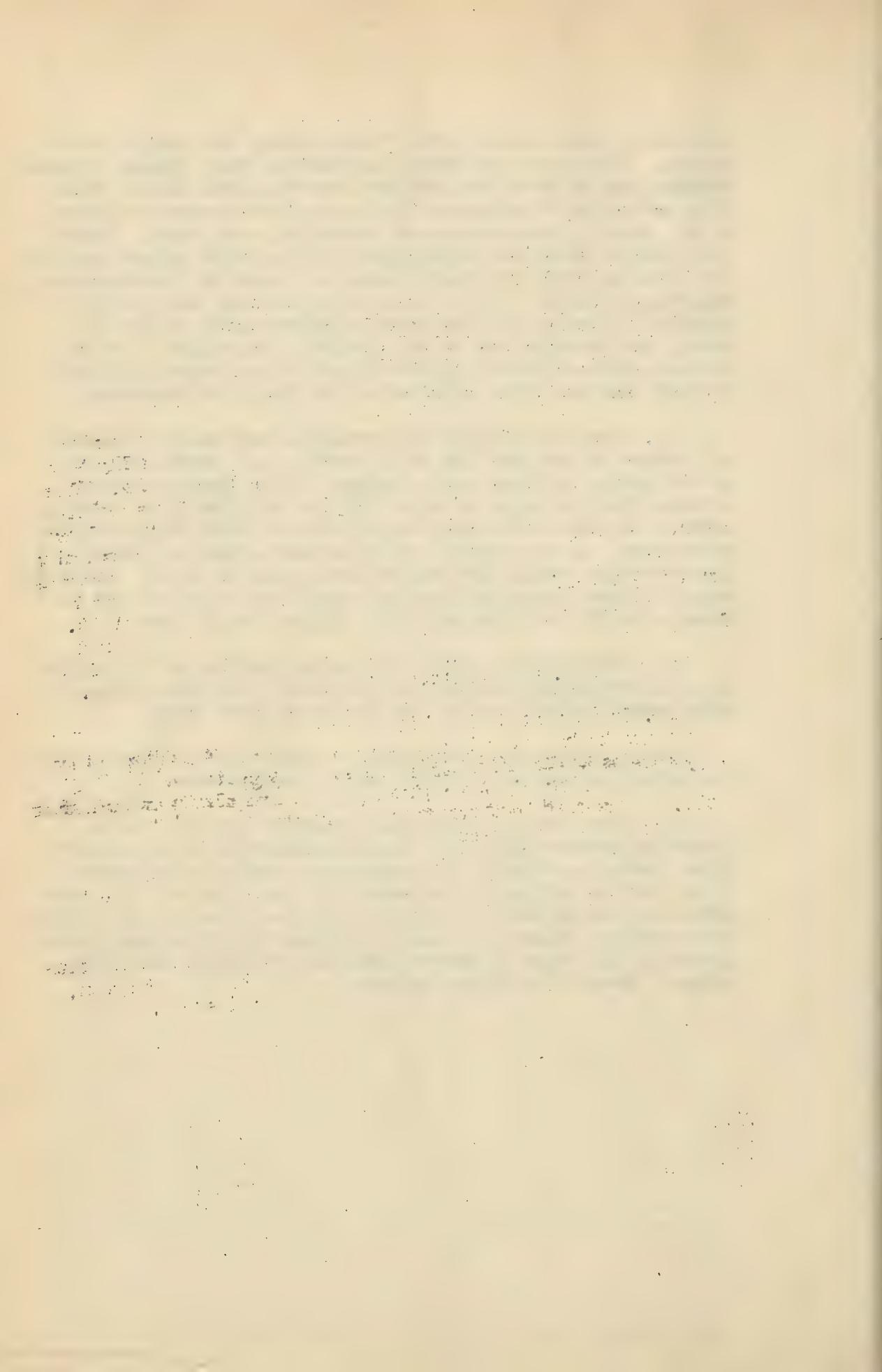
followed on snow shoes, both of them riding the sled on down-graies. After two days traveling this way they finally reached Woodchopper, forty miles distance from the Ames Cabin. When they arrived at Woodchopper they were given quarters and food by Mr. Berail, the watchman at the mining camp there. There is a landing strip at Woodchopper for commercial planes and one had been expected for several days as a woman at the camp was expecting a child. One of the men in the camp was going by dogsled to Circle and took three telegrams with him for Lt. Crane, one of which was to his parents. The night after he arrived a plane piloted by Bob Rice of Wien Alaskan Airlines arrived, and Lt. Crane returned to the field at Fairbanks.

Lt. Crane stated that his parachute was one of the handiest things he had ever had as he slept in it, used it to sew up his pants, and many other things. After landing he went without food for eight or nine days but had plenty of drinking water. He stated that the temperature was about forty degrees below zero. He was dressed in OD trousers, quilted jacket and Quartermaster mukluks and had an extra pair of socks. He found a pair of snow shoes in the first cabin but could not use them because he did not understand the Indian ties on them.

Lt. Crane weighed about 170 pounds when he left this station and about the same when he returned. The Base Surgeon, after examining him stated that he was in good shape.

Crane stated that his special craving all the time during the period he was in the hills was for milk shakes.

Lt. Crane is now twenty-four years of age and came to Alaska in October 1943. Lt. Crane stated that he believed the plane crashed southeast of Woodchopper, west of the Charley River, and is helping in the search of the plane and its occupants who are as follows: Pilot, Lt. Harold Hoskins of Houlton, Maine; M/Sgt. Richard L. Pompeo, of Mount Holly Springs, Pennsylvania; Lt. James B. Sibert, Norfolk, Virginia; and S/Sgt. Ralph S. Wenz of Pinedale, Wyoming.



SEARCH AND RESCUE SQUADRON ACTIVITIES

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3. The investigation of the crash of B-24, #42-40910, Cold Weather Test, on 21 December 1943, was reopened by the arrival of Lt. Crane, Station 3, ATC, co-pilot of the aircraft, at Ladd Field from Woodchopper and his report of the approximate site of the crash. Lt. Crane arrived at Ladd Field on 15 March 1944 after walking in from the Charley River cabin of Mr. Phillip Berail where he had spent two months following the crash.

Missions were dispatched 16 March 1944 to the reported site of the crash with Lt. Crane as observer, and the site and other pertinent data as to drift, place of landing of aircraft and Lt. Crane, and last sight of the parachute of S/Sgt. Pompeo by Lt. Crane were determined.

Two L-1 aircraft were dispatched to Woodchopper to carry on search work, and supplies, personnel, and equipment were flown in to Woodchopper to establish temporary base for searching the area. This base was set up on the Woodchopper mine field through the courtesy of Alluvial Golds, Inc., on 16 March 1944, and preliminary missions were run the afternoon of 16 March 1944.

Search formally began 17 March 1944 and continued through 24 March 1944 with the following missions executed:

A. Investigation of the wreckage of B-24,
#42-40910.

(1) The wreckage lies on the West bank of the Charley River about 2-1/2 miles west of the river and about 2000 feet above the river on a rocky slope. Much difficulty was experienced in locating the wreckage even though its outline was crushed almost flat and it was partially buried in a large snow drift and those portions exposed and resting on bare rock matched the rock color very well.

(2) The wreckage was found to have burned out from the waist gun positions forward and from the rear of the bomb bay forward. The fuselage, with the exception of portions of the top and side skin, had been entirely consumed by the fire that followed the crash.

(3) The whole of the fuselage was found to be filled with hard-packed drifted snow, the drift continuing parallel with the fuselage to a point about thirty feet beyond the normal position of the nose of the fuselage.

(4) Signs of pre-crash structural failure exist on both vertical stabilizer-rudder assemblies and on both elevator assemblies. The left rudder-stabilizer was entirely missing and the left rudder-vertical stabilizer was missing from the horizontal stabilizer up. The left elevator was somewhat crumpled from the crash and the control horn was broken free from the horizontal stabilizer.

The right rudder-vertical stabilizer assembly was clearly gone, both upper and lower bolts of the front attachment fitting having failed without distortion of the fitting other than minor scratches on the inside of the bolt holes. The lower bolt of the rear fitting likewise failed without distortion of the fitting and the upper bolt also failed by tore the fitting upwards as it pulled out. The right elevator control rod was broken free from its attachment to the elevator control horn inside the horizontal stabilizer. No pictures were obtained due to freezing of the shutter of the camera brought for the purpose.

(5) The fuselage of the aircraft was excavated and in the excavation two bodies were found, one at each waist gunner's window. One body was identified as that of S/Sgt. Wenz. At a later date it was determined that the other body was that of Lt. Siebert. No further bodies or portions of bodies were found although a quantity of ashes were found in the area of most intense fire and samples are being analyzed to determine if they are organic remains.

B. Search for missing personnel.

(1) Search of crashed aircraft was conducted as above.

(2) Search of the basin of the Charley River began on 17 March 1944 with the tracking down of Lt. Crane's movements to the point of his first camp fire in the ravine immediately adjacent and north of the wreck, thus proving the continued existence of the trail left by Lt. Crane during the latter part of December 1943. This job definitely tied down Lt. Crane's point of landing and definitely established drift and direction to the last sight of the reported parachute.

Interestingly enough, Lt. Crane landed on the same hillslope as the wreckage and upon a level with it and his distance from the wreck was a maximum of 300 yards, rather than the 10 miles previously reported, with a comparatively level treeless hillslope between him and the wreck. The fact of the discrepancy of reports and the fact that Lt. Crane did not return to the wreck, although within an easy ten-minute walk from the wreck, indicates he was suffering from mental shock and tends to throw doubt upon the accuracy of his report that he thought he could see S/Sgt. Pompeo's parachute drift over him 3000 feet or so above him!

(3) Detailed search of the area of probability of further survivors.

Inasmuch as any persons who successfully bailed out after Lt. Crane would have landed either between Lt. Crane and the wreckage or on the south side of the wreckage and in view of Lt. Crane, only low altitude aerial survey of this area was conducted. Since this area lies above timberline, a good view was obtained at very low altitude and very slow speed with the I.I., and no trace of human markings was seen, although numerous wolverine, wolf, and caribou tracks were seen.

In the case of the reported drifting parachute, enough information was received, and accurate enough bearings were obtained, to define clearly the area in which such parachute must land, and this area was combed on snowshoe and from the air without result. No signs of human tracks were found and no trace of signals, marks, or camps was found. Since the area affected is drained by streams three to ten miles in length emptying into the Charley River above, opposite to, and within a mile downstream from the cabin in which Lt. Crane spent the months of January and February, and since it is separated from other drainage by high precipitous ridges, without a doubt any one landing in the area and able to walk would have ended up on the Charley River. All streams were investigated and all intermediate ridges and slopes were criss-crossed looking for trails without result.

As a further check Mr. Phillip Berail, caretaker at Woodchopper and trapper and hunter, who owns the cabin used by Lt. Crane, was consulted and all cabins in the area marked in on maps and each was investigated. Cabins visited by Lt. Crane were noted and supplies he used were replaced. No further evidence of occupancy of any other cabins was discovered.

It is therefore presumed that any persons who escaped by parachute were unsuccessful in making landings on the rock-slide-covered, precipitous slopes and perished without leaving traces. This will be fully investigated as soon as snow melts. At the present time all of these bare slopes contain numerous deep, hard-crusted drifts and no thorough examination can be given.

(4) Remarks.

Further evidence of mental shock of Lt. Crane was noted in process of investigating the cabins of the route. His reports of having placed several S.O.S. signs proved groundless and no trace of signs of activity connected with their establishment was noted.

Evidence that M/Sgt. Pompeo either did not escape or was injured on landing to such an extent that his return to the wreckage was impossible came to light during the excavation of snow from the fuselage of the wreck. In the fuselage just ahead of the tail gun position was found a barracks bag tagged by M/Sgt. Pompeo and containing a complete set of arctic clothing. M/Sgt. Pompeo was flying in an electric suit and had he been able to do so would have returned to the wreckage to salvage what he could of his winter clothing.

A supplementary report will be submitted when chemical analysis of ashes is complete and a second as soon as the mountain is free enough of snow to permit examination of the areas now covered by snow drifts.

AMBULANCE CASE ON MOUNT REDCUBT

When last heard from, the bomber had been heading for Anchorage, Alaska, from some point on the Alaskan Peninsula, flying over a forbidding region of clouds and fog and jutting mountain peaks still marked Unsurveyed on the charts. It was about noon on June 1, 1942, and the last position reported had been somewhere in the region of Lake Iliamna. An extensive search by many aircraft had revealed not a trace of the plane.

At two o'clock on the morning of June seventeenth, Sergeants Don Harris and Charles Michaelis, the crew of the missing bomber, arrived at Anchorage in a fishing boat. They said the plane had crashed on a mountain they believed to be Mount Redoubt, a volcano, 11,000 feet high. They had stayed with the plane for two days, because the violence of the storms up there had prevented their leaving, weakened as they were by the shock of the accident. They told us that the pilot, Lt. Edward Clark, had either a broken or badly sprained ankle, and Lt. Joe Donaldson, the co-pilot, had a severe compound fracture of the lower part of the left leg, something wrong with his eyes, and was generally in a very precarious condition. These two enlisted men had done what they could for the two officers, neither of whom could walk, and then they were ordered to see if they could reach civilization and help. The sergeants had made their way down the Redoubt River to the coast in five days and waited in a shelter cabin until they attracted the attention of the fishing boat that had brought them to Anchorage.

After the men had told their story, a reconnaissance flight was made over Mount Redoubt. The weather was overcast, but between two layers of clouds we were able to see the smashed plane lying on the southwest slope of the mountain, at an elevation of approximately 7500 feet. After circling the plane as closely as we dared in an attempt to bring some cheer to the two officers, who we hoped were still alive, we sped back to the base, where I was ordered to lead a rescue expedition and take along such medical supplies as I needed. I selected three units of plasma, two ampoules of 50 per cent glucose, twelve rolls of prepared plaster splints, dressings, antiseptic solution, two Thomas splints, adrenalin in ampoules, and two Stokes litters. The latter are made of small-mesh chicken wire, reinforced with steel. They are like half a mummy case and have a dividing wall of wire and steel between the legs running from the bottom of the litter to the crotch. They are rugged, very heavy--about twenty-five pounds

in weight--and very clumsy to move about by hand, since they are more than six feet in length. But they will effectively splint a broken leg and generally protect a patient from injury during a journey down a mountainside.

At two o'clock that afternoon, we set out in a thirty-four-foot cabin cruiser, towing a dinghy, Sergeant Thompkins in command and Corncrial Van Skike serving as engineer. Our party comprised Sgt. E. I. Pobinette, Jr., Corp. Earl E. Karnatz, Corps. Darrell E. and Miles H. Prince, brothers, Costello W. Pizzutillo, John W. Garner, myself, and a Mr. Lee Waddell, a man of about fifty, who was to act as guide and set us on the right trail. All the enlisted men were in their early twenties, and I am in my early thirties.

What We Had to Face

When we had got under way, I talked over the situation with Mr. Waddell. He was incredulous when we told him the actual state of affairs. He told us that "setting us on the right trail" was impossible, since there were many trails, and even the location of the plane was not certain.

As he talked we all began to realize that the eighteen-hour trip we had contemplated was just a foolish idea, and that we had a hard job ahead of us. But after questioning me, the only member of this expedition who had been on the important reconnaissance flight, Mr. Waddell was satisfied that the plane was indeed on the southwest slope of Mount Redoubt. It became obvious that the organizers of the rescue mission should have had the guide on the reconnaissance flight to make use of his knowledge in deciding the number of men who should make up the expedition, what they should wear, what use could be made of aircraft for dropping food, and supplies as near the wrecked plane as possible, and what the estimated time of rescue would be. But we finally decided to make the best of an uncertain situation, since we thought every hour might count if we were to save the lives of the fliers.

At midnight, we arrived at Redoubt Bay, dropped anchor and rowed ashore in the dinghy to have a look about. We found a Norwegian fisherman and his half-breed helper, but neither had any information we could use, so we returned to the crash boat and slept until four A.M. on the eighteenth.

If we had unloaded all that we thought we should bring along, it would have taken twice our number to handle it, so we had to eliminate what we thought we could do without. We left the Thomas splints and most of the tinned rations. Each

of us had a pack board except Garner, who had an infantry pack, which none of us knew had to be properly adjusted--until it was too late. Mr. Waddell carried thirty-five pounds of our equipment even though his job was to guide, not carry.

I had the next lightest load, about fifty pounds, while the men carried sixty pounds apiece and had to take turns with the litters, which we all soon grew to hate. Each of us had a sleeping bag, head net, .45 and knife, gloves, some candy bars, and tinned rations. We each should have had a change of footgear, and I should have seen to it that each man had sunglasses and a little table salt.

At five A.M., we started up the slope from the shore to the plateau that led inland and was part of the plain following the path of the Redoubt River. The largest violets I have ever seen grew in profusion. Within a few hundred feet of shore, we found bear tracks. The marshy ground was covered with thick, tough grass that grew up to our knees. Little brooks meandered toward the Redoubt River some miles to the south of our track. There were numerous beaver dams with little lakes behind them. Both brooks and lakes were full of large trout and other fish. Beavers may, and probably do, work like beavers now and again, but those we saw were working more like boys playing hooky at the old swimmin' hole--just swimming about and diving. Still, one could hardly blame them in such beautiful surroundings.

A Thicket as is a Thicket

We had our second wind by this time and joked back and forth and even sang a little. Pack straps and packs were settling down to the shapes of our backs and we all felt fine. The gentle breeze and an occasional drink from the brooks kept us cool, and we had some mosquito repellent that kept the few mosquitoes at bay. Mr. Waddell, who by this time had asked us all to call him just plain "Lee," led; I came next as "Doc," and the rest of the party followed, called by their last names except in the case of Pizzutillo, whom we called "Pitt" for obvious reasons.

At two in the afternoon we came into a stand of tall green spruce surrounding twin lakes of clearest blue. Here we heard a curious loud, groaning cry like someone shouting. We found that it came from a huge white swan that was circling the lake. Near the surface, he lowered his precarious-looking landing gear and came to rest in the shallows, which he proceeded to explore with his long, yellow beak. He even stood on one leg for us and looked magnificently aloof. Two fuzzy ducks bobbed on the little waves near by.

As we circled the lake, we encountered alder thickets. Lee had to hack a path so that the boys could drag the litters through. The reason that alders present so great an obstacle is that their trunks lie roughly parallel to the ground. They start to grow vertically, like any sensible plant, but by the time the first snow falls they are not tough enough to stand straight up, but are bent flat to the earth. They keep right on growing through the winter and, when the snow melts, the trunk stays in a position parallel to the ground. With the budding of spring, the new growth starts straight up, only to be again knocked down by the blanket of snow. After several years of this, alder thickets are a tangle of horizontal limbs and trunks about the size of a man's wrist, and just about impossible to negotiate without chopping one's way through.

Above the lakes the land was rich and fertile. Wild onions grew three feet in height, and the grass was almost as high as our faces. In the protected dells, where the winter winds were not so severe, the evergreen trees grew very tall and straight. We all talked about homesteading this region after the war. It is only fifty minutes by air from Anchorage, yet it seems many hundreds of miles and centuries in time from what we know as civilization.

We had lunch in an open place and rested an hour or so. We kidded one another about how we would bore our grandchildren with tales of this expedition. Lee told us stories about bears, and the soldiers asked him if it was always true that they den up in winter--"because if it is," said Pitts, "we saw one in December that was walking in his sleep."

After lunch we climbed still farther, Lee taking advantage of the paths made by animals and old trails left by trappers and hunters. We soon left all stands of timber and came on another place that looked like meadowland, but which was in reality short, stubby grass growing through three inches of water. Walking in this was more tiring than walking in sand, and we were resting more and more frequently. Mosquitoes and little black flies, called appropriately "no-see-ums," increased in numbers so that we had to pull down our head nets. We were all tired, but nobody complained. The men kept up a constant stream of jokes and wisecracks. Pitts said it was all foolishness, this carrying plasma. We should just let the insects fill up on our blood, pluck them off, dig the stinger into the patient's vein, and squeeze.

Finally, at five P.M., after twelve hours of walking, all of us but Lee could go no farther, so we made camp beside a little brook. We built fires and warmed our food by standing

the cans close to the fires. We ate out of the cans, enjoying the hash or spaghetti as though we had not eaten for days. In the dessert cans there werehardtack wafers, coffee, lump sugar and a piece of chocolate. All of us but Lee then turned in to sleep while he whiled away four more hours hacking a path toward the Redoubt River, which we now heard in the distance. That job done, Lee too went to sleep.

At two A.M. on the nineteenth, Lee awakened us. Poor Miles Prince's eyes were about swollen shut from insect bites, and the rest of us were stiff and sore all over, but by the time we had packed up our gear and had eaten a little, we felt that we should not die, after all. We left even more of our precious food here, and our sleeping bags as well. We felt that we had to make a dash for it and that we should carry just bare essentials.

An hour out of camp, Garner could walk no longer. The infantry pack had been pounding him over the kidneys with each step. He had not complained about it, and none of us had known it needed adjustment. So we sent Garner back to where we had slept, to wait for us to return.

Finally we came to the Redoubt River. The warm sun cheered and warmed us, even though our feet were further hurt by the silt that filtered down inside our footgear when we had to wade the stream on three or four occasions.

Soon Lee shouted "I think I see the plane!" This discovery gave us new strength and we hurried ahead, realizing that we could not count on much good weather in this country.

At about eight P.M. we got to the base of a moraine which had looked smooth and solid when we viewed it from miles away. Just below it, we left all but four tins of rations and our extra clothing. Then we clambered up onto the moraine, which consisted of loose, porous sand and boulders.

Progress here was very slow, since we sank ankle deep in the loose sand, and the rocks gave unsure footing. We had to stop to rest every few hundred feet. As we climbed higher, large patches of snow began to appear in the crevasses of the moraine. These fields of snow, sometimes several hundred feet in length, were godsends in that we could walk along with comparative ease. However, this ease in walking was neutralized by the chilling we received because our socks and footwear were not thoroughly dry after our wading in the river below.

Soon we were just below the snow line. We found a little hollow in the lichens, built a fire of dried grass, and made

a little pseudo coffee, changed our socks and rested. We were up about 5500 feet, apparently the service ceiling of the Alaskan mosquito. Even at this height, Lee was able to point out the tracks of marmot, mink, otter, bear, moose and various birds. There were lichens of various hues, purple, bright orange and pastel shades of green. Flowers of as many colors grew in great profusion.

Within Sight of the Plane

In a little while we pushed on, in the snow now. At this point I was in relatively the best condition of anyone in the party, not because of any physical superiority, but because we had decided that it was best for me, the doctor, to go on ahead if possible, while the others brought up the litters and what few supplies we had left. To this end the soldiers carried the greatest loads, and Lee carried part of mine. By their work, the others had spared me to do my job.

So at this point I took the lead and broke the trail through the snow. In the dusk, at a point about a mile below the plane, we all huddled in the lee of a large boulder and ate the last of our chocolate, leaving two bars to carry up to the plane. The plasma and plaster were put in my pack, and I started off alone, thinking that if both officers were dead I could return and save the rest the back-breaking job of carrying litters and supplies any farther. If they were alive, I could make them comfortable until the rest arrived.

From here on, the rarefied atmosphere, deeper snow, and gusts of wind made climbing even harder, and from twenty steps with a stop, I gradually had to reduce my progress to a crawl with five steps between rests. Midnight came and went, and the sun began to rise at about two in the morning. The wind seemed to come from every direction. The sky was overcast, and wisps of clouds would blow past the black and ominous face of the cliffs off to one side.

At four o'clock I reached the upper end of the protecting ridge, but unfortunately the clouds lowered so that I could no longer see the plane or be sure of my direction. The grade became so steep that progress was possible only by pushing one's hands and feet into the snow to make little steps. Soon visibility was reduced to a few yards. At the end of a hundred yards of crawling, I found myself looking down into a great crevasse. Obviously I had overshot my mark and had to back-track a little. Then the cloud lifted slightly and, because the wind for a moment was favorable, I could make myself heard by my companions below me.

Darrell was able to tell that I had lost my way, and I made him understand that I wanted him to guide me. So I held out my arm first to the left and then to the right, and when I was pointing toward the plane, which was screened from me by a small intervening ridge of snow, he would signal to go ahead. In a few moments the plane loomed into sight above me.

It was lying at the edge of a crevasse two hundred feet wide and of unknown depth. It lay on the uphill lip, and in order to reach the plane it was necessary to go above it and then slide down. Between gusts of wind I crawled around the crevasse and then edged gingerly down to the plane. Between the bulkhead behind the pilot's section and where the door used to be, there was something rolled up in a sleeping bag. Crawling in to investigate what I thought would surely be a corpse, I was startled to have someone throw back the covers and say "Who's there?" It was Lieutenant Donaldson, perfectly rational, but a most pathetic sight.

There was the sick-sweetish stench of a gangrenous wound in the air. He was emaciated, and his face was covered with a twenty-one days' growth of beard. Both eyes were bright red from hemorrhages. His hair was matted and long, and he was covered with filth. He had not eaten for four days, so I gave him the two chocolate bars we had saved. He said that Lieutenant Clark had started walking down the mountain five days before.

I left Donaldson long enough to go outside again and fire one tracer, which told those toiling up after me that we had one officer alive. Then I huddled into the forward compartment to wait for the others. The first to arrive was Darrell Prince. Next came Karnatz, who had accomplished the most heroic of feats by dragging that stubborn litter across the windswept slope to the plane. Without the litter, we could have done nothing. Last to reach the plane was Lee Waddell, blue from cold and exertion. While we all got our breaths in the cabin, it rained or snowed outside.

We cut the silk risers off one of the parachutes that had sprung open, to use as a rope. Then, between gusts of wind, rain and snow, we loaded Donaldson, still in his filthy sleeping bag, into the litter, where he was wedged tight enough to be safe until we could get down to better ground. Then the four of us slid, pushed and carried the loaded litter up the mountain far enough to get around the crevasse and down the slope, sliding and slipping along in the hip-deep snow. The farther we descended, the easier became our job, and, at about six in the morning of June twentieth, we were on reasonably

level snow out of the clouds into the glare of sunlight.

With the parachute risers we made lines for hauling and braking. We fastened a piece of canvas to the front of the litter and let it trail back and under, else it would not have slid, and would have filled with snow. We checked the patient and found that his leg had remained well immobilized in the Stokes litter. He had tolerated the journey thus far very well and complained not of pain but of hunger and thirst. He was in surprisingly good condition.

Men Against Nature

At the upper end of the ridge, we found Miles Prince and Pitts. They had stopped there, completely exhausted. When they saw Donaldson, and when they heard that Clark had left five days before, their spirits rose and they got hold of the lines and helped with the job again. Robinette had stopped farther down than they, also completely fagged out, and had turned back, having no other clothing than his coveralls to protect him.

Floundering through the snow, softened by the brilliant sun, we descended easily and rapidly, picking our path in such a way that we always went down the hill. We would not have had the strength to pull uphill another foot. Snow got between my shoepacks and my skin when I sank in at times to my hips, making chilblains inevitable. I should have taken the time to adjust my trousers to keep the snow out, but foolishly kept on going. Progress was rapid and easy compared to our ascent, until we got to the moraine. Here we made use of every available snow field, running prayerfully over bridges of rotting ice and areas of snow we hoped would hold our weight. When there were no more snow fields, we had to carry the litter, stumbling in the soft dirt and tripping over rocks. We made but a few yards between rests. Again Lee, whose job was only to guide, exerted himself to the utmost in the brutal job of lifting and carrying the patient. Sometimes on a slope the litter would get out of control and patient and litter and the six of us would shoot down in a small avalanche of rocks, mud and ice until we could dig our heels in or hang on to something. We were very fortunate that we did not further injure our patient or ourselves.

At six in the evening, we left the moraine and followed the creek bed, and in it we just had to lift the litter from boulder to boulder all the way down. Finally, at ten P.M., we were completely played out and literally could not go another step. But from somewhere Lee summoned enough strength

to walk the mile to and from the moraine camp of two nights before to pick up some canned rations and our clothes. Meanwhile, the boys built a lean-to of alder boughs, and a fire. When Lee got back, our meal consisted of a can of hash and a can of beans for Donaldson, and a can of beans for the five of us. We had gone forty-four hours with little food or rest.

After supper, I decided to put a cast on Donaldson's leg, and, with the help of the two Prince brothers, whom nothing seemed to find at a loss, applied one running from the toes to the hip. When we cut off the flying boot and the trousers leg that was bathed in pus, I found a gangrenous wound of the knee and a badly infected wound of the lower leg, through which the splintered ends of both broken bones projected.

I showed the Prince brothers how to soak the plaster rolls in the brook, and while they were doing that I cleaned up the leg, straightened it out and laid it on a bed of dressings placed on a support of alder boughs. Donaldson suffered no pain from this. Next, a sterile dressing was placed over both wounds, and the plaster bandages were wrapped, with no further padding, around the leg. When the plaster had set, we wrapped Donaldson in his sleeping bag again and put him on a mattress of alders near the fire and trimmed up his cast with a hunting knife. As soon as the cast was applied, Donaldson said that he had no pain at all, and he fell asleep quietly in front of the fire. Then we all lay down like a litter of pups in a basket and were promptly asleep.

At four A.M., the sun woke us up. We gave Lee our remaining tin of hash, and then he started off for Anchorage with a note telling of Donaldson's condition and of Clark's departure.

Lee picked up Garner at the camp where we had left him, and the two of them walked to the shore, where the boys in the crash boat were waiting. Robinette had preceded them down.

As soon as Lee had left, we gathered ourselves together for the last effort of carrying the patient down to the flat place below the moraine by the river. By this time, our condition was such that we had to carry our packs down first and then return for Donaldson.

At the river, we had to rest three hours for strength enough to return. The final haul along the steep, boulder-strewn creek bed to the river was a nightmare of fatigue.

Finally, we made camp and put Donaldson under a mosquito bar, three of which we had brought along and left at the camp

below the moraine. We then lay down in the sun, with our head nets on, and slept. Later on, Karnatz shot a ground squirrel. While the boys were cuttin' it up, I decided to give Donaldson a unit of plasma. Under conditions of asepsis that must have made Lister turn a hundred and eighty degrees in his grave, the plasma and an ampoule of glucose were given, with Darrell Prince acting as nurse. Donaldson had no unpleasant reaction, and was immensely perked up by this short-circuited lunch. Meanwhile, the others had stewed the squirrel over a fire. We drank the juice and ate the meat, and we and our patient agreed that it was the best meat we had ever eaten. We made another shelter, built four fires around it and lay down to sleep.

It was interesting, if that is the word for it, to note what an efficient pattern Mother Nature had worked out for keeping a man without a sleeping bag uncomfortable: At night the mosquites rested from their labors, but it got so cold that we slept but fitfully; when the sun came up it got warm enough to sleep, but the mosquitoes kept us awake.

As we lolled about, wondering about Lee and how he was making out, we talked and joked. Karnatz said that our arms had lengthened so much from our lifting and carrying that we were probably the only six men in the world who could scratch their ankles without bending over. And how we talked! Not about blondes or even brunettes--nice enough dishes in their place, of course, but the dishes that intrigued us right then were steaks three inches thick, spaghetti, broccoli with hollandaise sauce, fresh, steaming bread with raisins, and ice cream smothered in fresh strawberries.

Next morning, we cut poles of cottonwood to tie to the litter so that the bearers we hoped Lee would send up could carry it comfortable. Then we waited until, far off, at about noon, we heard the motor of what proved to be a civilian-owned plane down the valley. We raced out onto the bar and madly waved our clothes and were rewarded by a wing waggle of recognition from the pilot. After the plane had circled us a few times, Lee shoved out a supply of rations on a parachute. We carried the food to our camp and prepared a meal from it--a meal that lasted until four o'clock the next morning. And Donaldson did his share too.

While we were thus foraging ourselves, Lee had flown back to Anchorage and picked up a group of thirteen volunteer soldiers who were flown to the twin lakes in float planes. From there, Lee led the men up to the Redoubt River, just above the camp where we stayed the first night, and told them where they would find us. Then he turned in for a rest to

await our coming. And a well-earned rest it was, for without Lee Waddell this rescue mission might well have failed. It was his knowledge that permitted us to avoid stretches of partially submerged ground, unsafe beaver dams, impassable alder thickets, and other constructions that would have trapped the tenderfoot. The manner in which he guided us through regions where, to us, one place looked pretty much like the next, was a constant source of admiration to us all.

Happy Ending

The soldiers arrived at four A.M. and dispatched what was left of the food before starting down the river. They lashed the poles to the litter, and eight of them at a time carried Donaldson along. Pitts led, and every few minutes they would say "All right, boys, take a blow," and they would put down the litter, and four fresh men would take the place of the four that were tired. So we descended, crossing and recrossing the icy river, the water making my chilblains burn like fire. Lift, carry, take a blow; lift, carry, and so forth, until late in the afternoon, when we saw Lee, haggard and bearded, waiting for us above the first camp. He led us to the camp, where we wolfed the tins of rations we had left there what seemed ages ago.

At the camp, we rested two hours. Donaldson by this time had a huge appetite. The mosquitoes were thicker than even Lee had seen them in his twenty years in Alaska. They swarmed around in clouds, and every mouthful of food contained its share of them. Their buzzing and biting made sleeping impossible, so that at ten in the evening of June twenty-third we packed up and started down the last leg of the journey to the twin lakes.

As we stumbled down the final steep slope to a little clearing at the edge of the second lake, we saw the sweetest of sights--a small place Bellanca on floats. We carefully laid Donaldson on the floor of the cabin, and then Lee, Miles Prince, Karnatz and I climbed aboard. And in fifty minutes we landed on Lake Spenard Airport in Anchorage, where an ambulance from the field was waiting for us. At three-thirty A.M., June twenty-fourth, Donaldson was safe in bed at the Station Hospital at Anchorage.

The next day, I found that Clark had reached Anchorage much as the sergeants had gone before him. Nobody in the original party and no one of the volunteers suffered any ill effects from the trip. After Donaldson had been in the hospital a few days, it was found that his foot would not need to

be amputated, as I had thought. Maggots had kept the wound clean. A fresh cast was applied, and he was sent to an Army hospital at Indianapolis, where it was reported that he would be flying again this year. And redoubtable Mount Redoubt is still there for anybody to climb who wants to.

EXPERIENCE OF TWO MEN FORCED DOWN IN ALASKA

On January 17, 1942, two flyers were forced down in northern Alaska 150 miles from the nearest civilized outpost. They made their way, with the help of trappers and their dog teams, back to civilization. Following is their story as told by one of them, Technical Sergeant Richard L. Pompeo.

On Saturday morning, January 17, 1942, at 6:15 a.m., Lt. Colonel H. H. Carr (age about 40, height 5 feet 8 inches, weight 145 pounds) and Technical Sergeant Richard L. Pompeo (age 20, height 6 feet 2 inches, weight 170 lbs) took off in a YC-64 loaded with medical supplies for Whitehorse, Yukon Territory, Canada. There were two other airplanes, an AT-7 and B-18, with us. There had been some B-26's crash at Whitehorse.

When we left Ladd Field the weather was soupy, and after a couple hours out the weather closed in on us. We were flying at 6,000 feet, at this time. The air began to get very rough and Colonel Carr spotted a valley running at right angles to our course and turned into it. We rode up and down this valley for about an hour or until the sun began to come up. Meanwhile, a severe snowstorm had developed at Whitehorse and the tower at Ladd Field had tried to call us back. Colonel Carr was listening to the radio compass and I was listening to the command set. However, for some reason we failed to receive the message so did not return. The other two planes both returned to Ladd Field.

When the sun came up we came out of the valley and climbed to 12,000 feet out of the soup. Unfortunately there was a 70 miles per hour wind at this altitude blowing north that we knew nothing about. We were flying entirely by instruments at this time so the wind soon blew us completely off our course. About this time our radio compass went dead. In an attempt to locate ourselves, Colonel Carr decided to spiral down through the soup to see if he could recognize any of the area since he had flown the Fairbanks - Whitehorse route many times. When we went down we found ourselves in a bowl completely surrounded by a rim of high peaks so we went spiraling back up as rapidly as possible.

We had now been out about four hours and couldn't locate Whitehorse so we decided to turn around and make for Fairbanks. We had a normal gasoline supply of 7 1/2 hours so Colonel Carr began to lean up the mixture. Up to this time,

we had been flying on full rich.

While we figured we were heading back toward Ladd Field, we were all the time being blown steadily north of our course.

When the gasoline supply began getting critically low and we knew we were hopelessly lost we again dropped down through the soup to try to locate our bearings. It was then that we discovered there was no timber on the ground and we must be north of the timberline. Colonel Carr then headed south and just about as we reached the timber line the gasoline supply gave out. Colonel Carr had gotten 9 hours and 15 minutes out of a 7 1/2 hour gasoline supply by using the leanest possible mixture. We then made for a frozen river bed for a landing and landed on the Sheenjak River about 5 miles in from the timber line. The landing would have been successful even on wheels had we not hit a stump. As it was we ground-looped but neither of us was hurt. The plane was damaged to the extent that subsequently two and a half months were required there to salvage it. The time of the crash was 3:28 p.m. I kept a very accurate log of the proceedings up to the time of the crash, but since then that record was stolen from me.

While in the plane, I had on O.D. wool trousers and shirt, cotton summer underwear, cotton socks, low cut oxfords, A-6 boots, light weight fleece-lined flying jacket, coveralls, fur-lined helmet (Type B-4) and D-2 mechanics gloves inside Type A-9 thumb, one finger mittens. Colonel Carr had on a pair of cotton socks, low-cut oxfords and A-6 flying boots, a pair of dry tan moosehide, (Siwash) gloves, long woolen one-piece underwear, pink wool shirt and trousers, light weight coat sweater and C.V.G. fleece lined coat (dry tan shearing). The plane was quite warm and we took off all the extras and were in our shirt sleeves, after we lit the fire pot.

In addition, we had stowed away in the plane three sleeping bags. Colonel Carr had placed in his sleeping bag a pair of Jack-buck Indian moccasins (dry tan moosehide), a pair of light wool socks and a pair of arctic wool socks, a G.I. toque and some woolen underwear, two mess kits and 2 canteens. The sleeping bags were the type which is sewed down one side, across the end and about 2/3 of the way up the other side. It consisted of an inner blanket of moleskin, next blanket of G.I. wool, and covered with heavy down. When the plane ground-looped, some acid ran out of the batteries and down on one of the sleeping bags. We washed it off with snow as best we could, but it was soon rendered almost entirely unfit for use. Fortunately, we had three in place of only two when we started.

Colonel Carr had fashioned an emergency kit sometime before. This was a standard procedure here to place these kits in a plane before taking off on a cross-country hop. This consisted of a 5-gallon can containing two cans of bouillon cubes, two one-pound boxes of rice, four chocolate bars (unsweetened), a one-pound box of salt, a one-pound box of pepper, a waterproof match container, a large box of household matches, four or five candles, a pair of cotton gloves, a compass, two mosquito head nets, three cans of corned beef, two boxes raisins, three bags of dried apricots and a box of cube sugar.

It is my usual practice when going on a hop of any length to take along something to eat. So, I had thrown in the plane two boxes (12) Hershey bars and two boxes (13 or 14) of fig bars. Also, the night before taking off I had swiped from the hangar a small hand axe and put it in the plane, personally checked out a hunting knife and a .45 automatic with four boxes of ammunition as we had had an alert shortly before at the field. On the plane was a .375 caliber rifle with five boxes of ammunition.

We stayed with the airplane for nearly two days (until noon Monday) getting ready to move on. We gathered wood for a fire Saturday night and in so doing put some rather serious gashes in our clothing. It was the usual practice of Colonel Carr to carry a curved needle in his bag of Bull Durham smoking tobacco. We cut the shroud lines off one of our parachutes and unraveled one of the lines to get thread to mend our clothes. I had about a six-inch tear in my A-6 boot which I fixed with this needle and thread and the sleeve was nearly torn off my jacket and I fixed this. We planned to take along the silk of the parachute to use it as a tent. We took three of the shroud line along, also.

The first night (Saturday) the Colonel and I split one Hershey bar and had three or four fig bars apiece. That night we slept in the plane in our sleeping bags even though the plane was upside down. This was my first experience with a sleeping bag and I had never slept out anywhere before. The Colonel had, however, been out before. The temperature was about 30° and it was dull grey with no sunshine during the day.

The next day (Sunday) we got up about 10 a.m. and made a stew of rice, a chocolate bar (the unsweetened chocolate) and bouillon cubes. Using plenty of snow water we made about 1 1/2 gallons of this thin soup. This lasted us all day. We used about 1/2 pound of rice. We thoroughly dried out sleeping

bags and gathered more wood and kept a good fire going all day. We had no suitable container for cooking purposes, so I cut the five-gallon bucket holding our emergency equipment in two and made a kettle. We cooked on the little fire pot (then used to pre-heat engines) and since we had only about one gallon of gasoline we cooked in the plane to warm it as much as possible at the same time.

Monday we prepared to move out. The Colonel had given me a pair of his long woolen underwear for which I was mighty thankful. We packed up to take along, in addition to that which we wore, all our rations, two sleeping bags the parachute silk and three shroud lines, all our firearms, the axe and compass. I placed a towel around my neck to act as a scarf to keep the wind from going down the back of my neck.

There was approximately 1 1/2 feet of loose snow on the ground, then a thin crust beneath which was another six inches of loose snow. The A-6 boots soon got full of snow, but I could do nothing about it. We were walking down a frozen river bed. The river bed was at this point about a mile and one half wide. I had suggested going down the left side, but the Colonel chose the right side, so we went down the right side. After traveling about four miles we ran into a trail running at right angles off from the river and here was a dog team and an Indian trapper. He could speak no English, but we made him understand the situation with signs. He had heard our plane overhead. By signs he let us know that we were approximately 150 miles north of Ft. Yukon.

This stroke of luck changed the aspect of our journey so we all headed back for the plane. Here we left the parachute we were planning to take along and laid our rations out for the Indian to pick out what he thought we'd need. We picked up the damaged sleeping bag and made for the trapper's cabin. By now it was growing dark. We couldn't move as fast as the dog team so the trapper would go ahead, stop and light a match and we'd make for the signal. There was still approximately a twenty-five mile an hour wind on our backs and the temperature was about 30°. In going down the river, I stepped in a place that had been cracked by the Indian and went into the water up about half way to my knee. I kept going and a layer of ice quickly formed over my leg and foot. My feet were nearly frozen by this time.

We covered 14 miles from the plane to the trapper's cabin without a single stop for rest, making a total of 22 for the first day. We arrived at the trapper's cabin about 11 p.m. and here found his partner who could speak English.

He told of hearing broadcasts on his radio (he had a Zenith 1942 radio) and of hearing us calling over our radio before cracking up. He didn't know where we were, however.

We stayed two nights and a day at this cabin to rest and prepare to move on. The next morning we could hardly move, for stiffness. During this day while out getting water, a plane flew over about three miles away. We had no signal flare so ran out on the river and waved coats, but it flew off without seeing us. It later developed that this was a civilian mail pilot who had flown off his course to look for us, but saw nothing. During the day we heard several radio broadcasts telling about our being lost and that searching parties were out looking for us. All of them were looking for us considerably south of where we were and we had no way of letting them know where we were or that we were safe.

We had oatmeal, tea and moose steaks with no seasoning to eat at the Indian's cabin. We had left our salt at the plane.

At the cabin the trappers had a number of mukluks so I was able to abandon my A-6 boots. The mukluks were tight on my feet, but aside from this discomfort my foot problems were fairly well solved. They didn't get wet any more, but they did get cold. I had only two pair of civilian socks on in them. The change in my foot gear was the only change we made in clothing.

About 9:30 a.m. on Wednesday the English speaking trapper, the Colonel, the best dog team they could fashion from the pick of their two teams, and I, started out for Ft. Yukon. We had cooked up a pound of rice with 1/2 box of raisins in it the day before, then let it freeze. We also had saved several caribou steaks for the dogs and 10 or 12 moose steaks for ourselves. These, together with our corned beef, rice and chocolate, were loaded on the dog sled.

The first day on the trail we had one moose steak, 1/2 pound of rice and one can of corned beef. The Colonel had a radium burn on one knee which was getting pretty sore so he drove the dog team. The Indian and I took turns breaking trail - one half day apiece. This was my first experience on snowshoes. We went down the river about one hour, then took through the woods. The Indian had much the better pair of snow shoes; his were smaller, lighter and turned up more.

The first day we covered only probably 8 to 10 miles. Then we came to one of the trappers little shelters and made

our camp. The shelter was just big enough for all three of us to crowd into it in our sleeping bags. We'd given the Indian the sleeping bag that had acid on it. This was the last night we slept inside for the next seven.

The second day on the trail I had been complaining to the Indian about my cold feet when all at once he scraped the snow off a hump by the side of the trail and produced some sugar sacks wrapped in burlap. He cut up the burlap and wrapped my feet in it and from then on my feet were never cold. We added some sugar to our ration supplies and went on. (The sugar was the Indian's. He had not gotten it all the way home yet).

Straining to see in the dull grey daylight when breaking trail was very hard on the eyes. I had my regular glasses (rather thick concave) on. We had our tinted goggles, but they were no good on the trail for they fogged up too easily. I was nearly blinded for a few days.

While on the trail we ate two meals a day. The Indian didn't like chocolate so the Colonel and I split the chocolate bars to eat on the trail. The first four days we had tea. The rice we had cooked and frozen lasted two days and the corned beef we ate on the 2nd and 4th days. After that it was only moose meat. The Indian always threw the moose meat in the fire and cooked it almost black. It was very tough and not exactly palatable.

We didn't wear our heavy coats on the trail while walking, but as soon as we stopped we always put them on. We always built a big fire in the morning and dried our sleeping bags before moving on. We usually walked from about 8 a.m. to about 4 p.m. We always slept nude in sleeping bags.

At night we cut logs and built a three-sided wind break about four feet high. Then we built a good fire across the open end and used our jackets to fold up over our heads. We would construct a long tunnel to breathe through and then brush off the loose frost in the morning.

We were eight days on the trail from the Indian's cabin to Ft. Yukon. On Tuesday night (the 7th night) we came to a two-shack settlement. The Indian family here had 12 children and very little to eat, so a little coffee was all that they could offer us. By now, we were out of rations for either ourselves or our dogs. We had not seen a single live animal to shoot at, although we had seen a great deal of evidence that they were moving just ahead of us. We didn't

take any time out to really hunt. By now we were on the Porcupine River and about 35 miles from Ft. Yukon. This night we slept inside on the floor in our sleeping bags and again we heard radio broadcasts of the search being conducted for us without success.

The Indian at this shack decided to go into Ft. Yukon with us so we now had two dog teams so split up two men to the dog team. We covered 23 miles of unbroken trail, then came out on a well-packed trail for the last twelve miles. After reaching Ft. Yukon, it was not until noon the next day that we were able to get a radio message through that we were all right, and then it was still another day before a plane was able to come for us. Then, ironically enough, we were forced into an emergency landing field on the way home by bad weather. We finally reached home safely just two weeks after we had taken off for Whitehorse.

I was in very good physical condition before this trip as I had been playing basketball all winter. Even so I lost 14 pounds. The Colonel did not lose quite that much, but he did not walk all the way as I did. In the mornings my ankles would be quite stiff, usually, but soon loosened up. Although we ate only two meals a day I was never particularly conscious of being very hungry on the trail. We did notice, however, that we needed more frequent rests and fatigue set in sooner in the day as the trip progressed. One item in particular that we did not have along but wished for was toilet paper.

The following is a list of items Sgt. Pompeo would term necessary in an airplane to meet all emergency conditions:

1. Equipment

- a. Compass
- b. Waterproof Match Container (full)
- c. Extra Matches
- d. Sewing Kit consisting of linen thread and curved fabric needle
- e. Good Hunting Knife
- f. Light Double Bit Axe - about 2 lbs
- g. Snowshoes - large trail breaker type
- h. Sleeping bag - Q.M.C. Model 1942 three-piece bag
- i. Frying pan, 1 stew pot, 1 pot for tea or coffee, tin plate and cup
- j. Eating utensils
- k. Six candles - flash light and spare battery
- l. Medium Power Rifle (.30 - .30) carbine (if weight and space are not limited .30 - .60)

- m. Colored Signal Panels
- n. Flare Pistol and Flares
- o. Good Sun Glasses
- p. Rucksack

2. Clothing

- a. Two pairs wool socks per man
- b. Jack buck moccasin, snow boots or similar suitable foot gear
- c. Two pairs felt insoles
- d. Gauntlet type mittens with heavy wool mitten liners.

3. Food

- a. Tea
- b. Pemmican
- c. Vitamin pills
- d. Dried fruit (apricots, prunes, apples, etc)
- e. Bouillon cubes - sugar cubes - salt - pepper
- f. Bully beef
- g. Rice (polished) and raisins
- h. Semi-sweet chocolate (no nuts)
- i. Hardtack

LAND RESCUE PROBLEMS OF THE ELEVENTH AIR FORCE

From 19 February to 20 March 1945, I visited the Eleventh Air Force as an observer of life raft and exposure suit tests sponsored by the Physiological Branch, Proof Division, AAF Proving Ground Command, Eglin Field, Florida. During most of this period our party was on Attu, but we made brief stops at Adak Island, Shemya Island, and Cold Bay. At the first named place we had an opportunity to examine the equipment of the Air Base's Land Rescue organization and to talk at length with Lt. J. L. Fuller, the newly appointed Land Rescue officer. At the last named place we participated in one way or another, in the rescue of three survivors of a C-47 crackup which took place in the vicinity of Mt. Pavlof on the morning of 18 March 1945. The following comments are offered not in the spirit of censure, but in the hope that they may help to bring about prompter rescue of personnel throughout this remote and difficult area.

The Mt. Pavlof Tragedy

On the morning of 18 March 1945 a C-47 of the Troop Carrier Command, while making its way to Cold Bay, crashed into a snow-covered slope a few miles northwest of the active volcano, Mt. Pavlof. Three persons were killed, probably instantly. But the pilot, co-pilot, and one member of the crew lived, and it is believed that all three will survive their injuries.

I heard first of this crackup 20 some hours after it had happened, through Col. W. E. Elder of Eleventh Air Force Headquarters, who called me by telephone at about 0900 hours on 19 March, just as the B-17 which had been assigned to us was about to leave Adak for Ladd Field. Colonel Elder stated that since we had shown such interest in survival problems, we would probably want to talk directly with "survivors of a crackup which had occurred near Cold Bay." Since our party was scattered at the moment and a conference appeared to be out of the question, I asked our pilot, Lt. Reidy, to stop at Cold Bay on our way east. This he said he would do and proceeded at once to re-effect clearance.

Clouds and falling snow forced us to circle the base at Cold Bay twice before landing and we broke one of the lights of the landing-strip as we alighted. We arrived there shortly after noon.

Going directly to Operations we discovered that the rescue had not yet been made and for the first time learned some of

the details of the crackup. The accident had occurred at about 0830 hours on the day before. The plane had been on its way to Cold Bay, evidently had got off the beam, and presumably because the pilot had been unable to distinguish the whiteness of the mountainside from that of the snow in the fog, it had crashed. Six men had been aboard, but no one knew how many were still alive. The plane had been discovered promptly because after it had been overdue a while everyone had been on the lookout for it.

The crackup was described to us. Evidently the plane's left wing had struck first and been torn off. The nose had then dug into the snow and the whole fuselage had overturned. The other wing was still attached. Had the nose not dug in nor the fuselage overturned the whole plane probably would have slid into a deep gorge. The remains of the plane were only a hundred feet or so from the brink of this gorge.

As to survivors, everyone was convinced that at least one man of the six was still alive. This man had been seen repeatedly. He had run out of the wrecked fuselage and waved his arms in acknowledgment of various items which had been dropped. He had appeared to be in good shape. Many officers believed that two men were alive and some reported that "two men were seen at first, but that when more stuff was dropped only one man had come out to acknowledge it." Thus did reports vary.

I made inquiry at once as to whether anyone had attempted to parachute to the wreck, and was told that several officers (friends of the crew, and others) had volunteered repeatedly to jump shortly after the wreck was discovered, but that the Commanding Officer of the base had forbidden jumping. Many were very angry over this, partly because the weather had been so good the day of the crash.

We soon learned that various rescue operations were already under way. Two parties had set out overland and a third was making its way round the end of the peninsula, through Isavotski Strait, in a crash-boat. This party would land, it was believed, in the vicinity of Moffet Bay (southwest of Cape Leontovitch) about 15 miles from the wreck, and proceed overland to meet one (or both) of the land rescue outfits on their way out with the survivors. When we inquired as to what those three outfits had in the line of rescue equipment, no one was able to answer us. The general statement "they have motorized transport" seemed to satisfy everyone. So far as we could discover no one had any sleds; no one was sure that the parties were properly equipped.

with tents, snowshoes or skis; no one was sure even about the food or extra clothing the rescue parties had with them. Having seen something of Aleutian weather, we began to wonder how soon it might be necessary to send parties out to rescue the rescuers!

The more we looked into the matter the more clearly we saw how badly a coordinator of activities was needed--some-one willing to sit at a desk and write down (a) the names of the men in the various parties; (b) the exact equipment of each party; (c) the exact items dropped directly to the survivors of the wreck, etc. Being especially interested in the matter of shelter we ascertained through someone that a tent was among the stuff which had been dropped at the wreck proper. This was a huge pyramidal tent weighing 250 pounds, a tent which would have been difficult enough even for perfectly sound, trained personnel to put up, but no one seemed to know this. No one seemed to realize how a tent can flap about or blow away in the wind; how tent-poles can break; how pegs can pull out of the snow faster than they can be set in, etc. We learned also that a radio had been dropped, but that no word had been received through it from the survivors.

Word continued to be brought in concerning the various rescue parties. One oversnow vehicle had got stuck at a river. That party had broken up. Two men had been seen going ahead, but most of them were staying behind, etc. The crash-boat had got round to the vicinity of Moifet Bay but had not been able to land because of shoal water, surf, etc. No person from any rescue party had yet got near the wreck itself. Even with continuing good weather (which we all know wasn't likely) it looked as if no one could possibly get to the survivors for another 24 hours or more.

It was about this time that Captain P. F. Scholander of our party decided that what was needed more than anything else was for a medical man to get to the survivors. He evidently had been talking with Capt. Estes, who had been dropping supplies to the wreck from a C-47, and thus had come to some sort of agreement as to how the thing might be done. At about this time also, Colonel Nedwed of the Air Inspector's Office, showed up, and while Scholander was finding suitable footgear, heavy trousers, matches, etc., Colonel Nedwed countermanded the local C.O.'s orders and directed that the men should proceed with jumping. Accordingly, Capt. Scholander, Capt. Weston, (the Medical Officer of the base), and Capt. Mullen (the Chaplain of the base), found parachutes and prepared to jump.

Piloted by Capt. Estes, the three men jumped. I didn't

even know they'd taken off, for Sir Hubert Wilkins, other members of our party and I were looking into the matter of sleds and other equipment; but word reached us shortly that all three had landed safely a mile or more down-slope from the wreck; that no one had suffered the slightest injury, apparently; that Scholander, who had jumped first, had been able to help the other two spill the wind from their chutes, and was rapidly moving up the slope to the scene of the mishap.

Knowledge that three sound men were at the wreck to help the survivors speeded the work at the base and gave everyone a feeling of great relief. Mr. Miller of our party worked diligently making a light weight tent. Under Sir Hubert Wilkins's direction the carpenters made and crated for aerial delivery two sleds for hauling out wounded personnel. Personnel from the Search and Rescue outfit at Elmendorf Field arrived and it was decided to ask Elmendorf to send as soon as possible dog teams, Thaden sleds, etc. to help with the rescue. Elmendorf reported that they would have the required equipment and dog drivers on their way that night and at Coli Bay the following morning.

Sir Hubert and I spent the evening getting the newly made sleds and other items ready for aerial delivery. We slept at Operations so as to be ready for action.

The following morning three men from Elmendorf prepared to parachute to the wreck, two teams of dogs, sleds, etc. came from Elmendorf, and the two teams with their drivers set off promptly for the wreck. They moved across the coastal plain rapidly for a time, but when they reached one of the larger rivers they had to signal for a raft in which to take the dogs across. A life raft was dropped to them from a C-47, but the operation delayed them considerably.

Sir Hubert and I found the Thaden sleds from Elmendorf Field to be sorely in need of repair. There were no hauling ropes at the front, and many leather thongs were missing. The whole base was so disorganized that it was difficult to get a given thing done in any way save by one's own efforts. Example: three separate times a person who happened to be standing by offered to get some rope for us, went off with the best intentions in the world, but neither came back with the rope nor sent word as to his inability to find any. Reasons: he ran into other problems while hunting the rope and forgot about the sleds and their repair. Result: unable to find the proper rope, we cut up what we could find, pulled it apart into three strands, and made out as best we could.

When the tent which Miller had made was ready and the Thaden sleds were repaired, quantities of food were packed in cloth sacks and big milk cans for aerial delivery. Here again, it was obvious that no one had thought in advance of the problem of packaging food for transporting or dropping to survivors of crashes. Some of the ground coffee was in a lidless can.

When the C-47 was ready, we loaded the sleds, snowshoes, food-cans, etc. and set off. The sleds were not wrapped nor crated in any way. Crew members were roped to the airplane to insure their not being thrown out. The tops of the mountains were shrouded in fog. Mt. Pavlof was not visible. Following a stream from the coast we found the wreck, and circled it several times. Approaching the forlorn scene, we swept low so as to drop the supplies accurately. A man who we thought was Scholander was standing near the battered fuselage. He was to have written a message for us on the wing of the plane indicating how many men were alive, what he needed most, etc., but we could make out nothing legible there. Someone noticed that three stakes were standing side by side in the snow. We sensed that these were significant and guessed that they indicated three dead men. The first Thaden sled flopped back and forth like a dead leaf as it fell. It appeared to land beyond the brink of the gorge and to slide down the steep wall. The turbulence over the gorge was bad. The updraughts were so strong that our plane bucked like a broncho. The pilot skillfully brought us round, headed for the coast, and prepared for another low pass over the wreck.

Most of the items we dropped that day landed close to the wreck. We saw one man, presumably Scholander, at the wreck, each time we made a delivery, and we assumed that the Chaplain and Medical Officer were inside the fuselage caring for the wounded. No tent had been put up. Some distance from the wreck, perhaps two miles down-slope, we saw two men. We did not know who they were because we had forgotten about the three Elmendorf Field men who had been scheduled to jump that morning. Why we didn't see three men in the approaching party, I don't know. Everything was happening fast, it was difficult to see anything at all clearly, so we probably simply failed to see the third man.

On our way back to the base we flew back and forth above the dog teams and the land rescue parties for an hour or more. All these outfits were moving forward laboriously enough. It became more and more evident that Scholander's idea of getting to the wreck promptly through parachuting was a very sound one.

At the base Lt. Reidy, our pilot, informed me that a wire had been received from Ladd Field ordering our B-17 back so, believing that the situation was well in hand at Cold Bay, our party planned to leave at once. Sir Hubert Wilkins, who could write his own orders, decided to stay.

From this point on what is set down here was reported subsequently by Scholander, Weston, Mullen and others. When Scholander arrived at the wreck he found the three living men in sorry shape. The pilot and co-pilot, who had been pinned upside down in the cockpit, had been chopped and sawed out by the sergeant of the crew, who himself had been hurt, but who had, nevertheless, been able to limp about, working and resting by spells. Time after time he had become faint and groggy, but somehow he had managed to free his fellows from the metal which had held them fast. No one of the three men was particularly hungry when Scholander arrived. He had to coax them to eat. His arriving when he did might have saved their lives. As soon as Weston arrived at the scene (he and Mullen had landed a mile or more from the wreck), he and Scholander put blood plasma into the wounded men and made them as comfortable as possible. They continued to use the fuselage of the wrecked plane as their shelter.

Further details concerning the Mt. Pavlof tragedy should be obtained from the AAFPGC reports written by Scholander himself. It may be stated here, however, that the actual rescue was finally effected by a plane on skis, flown in by a civilian pilot from the Alaska mainland. The landing and takeoff were made without great difficulty after Scholander had chosen a place which he believed to be sufficiently smooth, firm, etc. The dogteams got through to the wreck finally. Several men had gathered at and were living in and about the wreck by the time the rescue was effected. There was plenty of food for everyone.

Getting the dead personnel out was difficult for they were jammed under and behind the cargo.

Scholander said that had it been necessary to drag the wounded and dead men out by hand the available sleds would have been very inadequate--in short that a 'featherweight' sled was badly needed for such work. He stated repeatedly that the heavy clothes he was obliged to wear in parachuting were a nuisance. After parachuting he had had to get out of them as soon as possible, leaving them in the snow. What he had really needed was light, tough, windproof garments.

Scholander, Weston, and Mullen had never jumped before.

Scholander, in jumping first, ran across to the door and leaped out without hesitation even though the test chute which had been dropped to give them an idea of drift, etc., had failed to open. Weston, who had told the crew to shove him out in case he showed signs of wakening, made the mistake of pulling his ripcord inside the airplane with the result that the pilot chute caught and was jerked off and part of the aircraft's tail assembly was torn away, but he landed successfully nevertheless.

Scholander's bravery and self-confidence were certainly commendable. His belief that anyone can jump at any time, anywhere, without training, etc. should not, however, be the basis for encouraging personnel to wait for the crucial moment before beginning to think about the problems of jumping. Had the snow not been fairly deep, had the men landed in or on the side of the gorge, had any one of the three been injured, the whole story might have been very different. In other words, Scholander and his companions were lucky as well as brave.

Land Rescue Problems at Attu

We had occasion to learn something of the Land Rescue setup at Attu in an unexpected way. We were busy with life raft tests, etc., of course, and had our hands full with that work; but much interest was expressed in the problems of crossing terrain in winter, weathering storms, etc. Part of this interest had been roused by recent and needless loss of personnel on the Island of Agattu. We were asked to recommend procedure in case a party were lost on the island in winter. This we did with some care, bearing in mind the special local problems of quick weather change, heavy snowfall, bad winds, crevasses, snowslides, etc. Our recommendations were turned in in typewritten form.

Finally we were asked to help the work by outlining a sort of scenario to be filmed while we were there. This request was a bit overwhelming, but we thought about it and resolved to do what we could. After discussing at some length how to go about such a job, we decided to ask the local Land Rescue outfit to simulate a rescue, using their equipment, thus permitting us to learn exactly what was available, what their customary procedures were, etc. Our idea was to suggest changes where we thought this necessary or desirable.

The more this idea developed the more difficult it seemed to be to get precise information as to where equipment was kept, who was in charge, etc. The Land Rescue outfit was supposed to have a snow jeep or some sort of motorized transport

"ready to go at a moment's notice." Yet when we tried to find this vehicle no one seemed to know where it was. When we went so far as to 'pin certain officers down', we learned that someone had taken the vehicle "somewhere out on the road" that morning—in short, that no one at hand knew where it actually was. This was discouraging, for it was clear that no outfit was all set to go in the sense that a good city fire company is ready for action.

When we tried to ascertain exactly who was responsible for land rescue work we found that a certain major with an important Operations job had also been appointed Land Rescue Officer; that he had finally realized the impossibility of carrying on the two jobs, and that the Land Rescue job had just been passed on to Lt. Fuller, an able young man who was obviously eager to do the right thing but who had not had any experience with equipment, had never been on snowshoes, and had only a vague idea as to what was needed for land rescue work.

Lt. Fuller took us to the room where kits and other equipment were stored for use of rescue parties. Some of the equipment there was good, but much of it was not ready for use. For example, there was no gasoline for the stoves. It was necessary to unpack the kits to ascertain that such items as this were missing. A party starting off on a rescue mission would have grabbed up the kits thinking these held everything needed and might have been miles from the base before learning that there was no fuel for the stoves! There were no tents and no sleds. Someone believed there were some sleds somewhere on the island, but where were they? It became increasingly clear to us that no one person knew where the rescue equipment was, what it was, what was in the kits which were supposed to be ready, or even what ought to be in those kits.

The basic reason for this lack of organization became apparent as we discussed the problem realistically: No one believed that an accident would be happening there. Accidents always happened somewhere else. When accidents did happen, they nearly always happened at sea anyway, and the few that happened on land were always far, far away. Furthermore, in case there was an accident some other outfit surely had equipment ready for use. The tragedy at Agattu, only one island removed, had wakened some persons to the need for training and careful choice of rescue equipment, but most persons still felt that the chances were against any repetition of such a mishap. This belief in good luck, coupled with a conviction that when accidents did happen nothing could be done about them, had just about killed real interest in land rescue work.

A person has to see Attu in winter to appreciate fully the problem of getting a land rescue problem under way there. Much of the time the weather is unbelievably bad. At such places as Ladd Field where there is bright weather and little wind for weeks at a stretch, men like to get out on skis or snowshoes for the sheer joy of the outdoor exercise. But there is nothing inviting about an average Attu winter day. The prospect is gray, chilly, raw, wet and uncomfortable at best--and always there is the chance of falling through into a brook or crevasse, or being buried under a snowslide. In such an area as this any move toward training men afield has to be made against tremendous inertia and what sometimes amounts to positive hatred of the weather. Survival training is robbed wholly of its romance. Nobody dreams of digging through the snow to find material for starting a fire, for even if you start a fire what are you going to burn? There are no trees, no brush piles, no driftwood to speak of, hardly ever a bush! The grass and moss are wet. I know whereof I speak in the matter, for I tried several times to build a fire with materials available along an average stretch of Attu shore and failed. Even with such aids as heat tabs, these outdoor fires were dismal at best.

The best of outdoorsmen think twice before starting across country on Attu in winter. The weather is so quixotic; and when the wind does rise it is so likely to become a gale. It must not be forgotten, however, that personnel in general need to learn through experience what they can and cannot do in weather of this sort. The seasoned outdoorsman recognizes the fact that Attu winter weather is disagreeable; but he also knows that the temperature is never very cold and that there is little danger of frostbite or freezing to death if he is properly clothed. He knows enough to stop traveling if the wind becomes too strong for comfort, and to sit the storm out if necessary. He is acquainted with the dangers which attend traveling when visibility is poor. On 12 March 1945 I snowshoed (with four other men) from Casco Cove to the head of Temnac Bay and back without any sort of goggles. I was interested in seeing whether with that much exposure I might develop a slight case of snowblindness. I did not get snowblind; but on the way back, in taking a direct course for certain buildings on the very last lap, I stepped off a snowbank and fell about 12 feet into a streambed. The visibility was poor that day.

The Tragedy at Agattu

A few months before our stay on Attu two men needlessly lost their lives on the Island of Agattu as a result of lack

of experience and training in survival procedure. The tragedy occurred this way: Five Sea Bees had been put ashore from a good-sized boat with lumber for a radar installation. Since the day appeared to be fair and agreeable they expected no trouble from the weather and took with them neither camping equipment nor food. They had a small tender and the vessel lay at anchor close by waiting for them to finish their work.

As is so often the case in the Aleutian Chain, the unexpected in the way of wind happened. A gale swiftly rose from the north whipping the water into waves so violent the men could not return to the vessel in their tender. This in itself alarmed them; but when the larger boat to avoid blowing ashore, weighed anchor and moved off, they became desperate.

No one knows exactly what happened, but it is believed that shortly after the larger boat left, the 5 men separated, perhaps into two parties. In any event when, the following day, the vessel did return, the rescue party found only 3 survivors.

Had the party been trained in survival procedure they would have known, first, that even the most savage storms in the Aleutians are usually of brief duration; second, that the temperature rarely becomes severely cold; third, that even in a 2 or 3 day storm average men will not freeze or starve to death providing they take care of themselves. The party made a serious mistake in separating at all. They would have done best, of course, in staying at the installation itself, for the location of the tender, pile of lumber, etc., was well-known. Their behavior was human enough for it is as natural for alarmed men to want to be on the move as it is for lost men to rush headlong through the brush in the hope of bursting into the open or coming suddenly in view of some well-known landmark.

Everyone on Attu with whom I spoke concerning this Agattu incident seemed to feel that had there been some training in survival the tragedy would not have occurred. The men would have been taught how to conserve their body heat in a storm, how to make a shelter out of the snow, how to sit in the snow and walk back and forth along a trench if necessary to exercise in order to keep from freezing to death. They would have known, too, the dangers of becoming snowblind, even in gray weather; they would have known how to improvise signals and how to live on animal food obtainable along the seashore. Had they had some such training they probably wouldn't have felt it necessary to leave the installation at all. They certainly would not have separated, and the chances are they

would have given their attention to erecting a shelter in which to care for survivors in case the vessel was wrecked.

Recommendations

1. That every base in the Eleventh Air Force be equipped for land rescue work at least to the extent of having
 - a. A Land Rescue officer in charge who is acquainted with survival procedures, rescue equipment, etc.
 - b. A warehouse or storeroom in which equipment is kept ready for instant use in rescue work. This may vary somewhat from base to base, but some of it should be uniform throughout all bases so that however a rescue is to be carried out, all who participate will know that they can count on finding certain equipment at all bases. Furthermore, the Land Rescue officer will know what this equipment is and how to use, repair, and inspect it.
 - c. A Land Rescue Squad, made up of men who have had training and experience afield, organized under the direction of the Land Rescue Officer for action at a moment's notice.
2. That a directive be issued from Washington making it possible for Eleventh Air Force Headquarters to select men for special training in survival, parachute jumping, etc., so that these men can build up and take charge of Land Rescue Squads.
3. That Personal Equipment Officers be consulted before Land Rescue equipment is procured, survival kits are made up locally, etc. Personal Equipment Officers will have good ideas as a result of their familiarity with equipment.
4. That all personnel at various bases be given regular field training in survival.

s/ George M. Sutton
t/ GEORGE M. SUTTON
Major, Air Corps

THEN I JUMPED

Search planes found the wrecked transport on a mountain, near the tip of the Alaskan Peninsula. Flying blind, it had plowed into a vast snow field at 170 miles an hour. It cut a swath for half a mile, and stopped near a precipice on the edge of Cathedral Valley.

I saw the wreck from a troop-carrier plane, circling between Cathedral Valley and Pavlov Volcano. It was 2000 feet above sea level. We could see pieces of one wing and a motor strewn along the mountainside. The plane, a C-47, lay on its back. One wing was still attached.

A man was leaning against the fuselage. He didn't move. He didn't even wave to us. As a doctor, I knew he was suffering from shock, if nothing more. The Arctic cold would finish him unless he got medical help quickly. Others in that battered fuselage--if any were alive--must be in desperate need, worse than the man we could see. He, at least, could crawl outside and stand upright.

We flew back towards Cold Bay, the nearest base. On the way we sighted an Army rescue party crawling overland, in a snow jeep and a tractor. Forty miles of cliffs, rivers and deep snow lay between the base they had just left and the helpless fliers on that precipice overhanging Cathedral Valley.

In my judgment, the rescuers couldn't arrive for a week or more. They would be too late; the race with death would be lost. The pilot of my plane, Lt. John Estes, of Waco, Texas, agreed with me.

We talked of using a ski plane. There was a place near the wreck where a small ski plane could land. But it would have to be ferried from a distant base at Anchorage. By the time it reached Cold Bay the treacherous Aleutian weather would be closed in. The weather was momentarily flyable, and might hold for a few hours. If anything was to be done, it was now or never.

I think that I knew then, deep down, that I was going to make a parachute jump, the first in my life. I could marshal all sorts of arguments against jumping. I was a ground-force medic. I knew nothing about parachutes. This was an Air Force problem, not mine. Besides, I was on leave, flying home after eighteen months of duty on a bleak island far out the Chain,

I wanted to see my wife, and the son born during my absence. This was no time for leaping in a parachute, somewhere between a red-hot volcano and an icy precipice.

Our plane landed at Cold Bay. Lieutenant Estes and I urged that parachute jumpers be sent out. The emergency called for a flight surgeon, one of those gallant Air Force doctors trained to leap and save lives. But there was no flight surgeon. The only Army medical officer at Cold Bay had gone with the land-rescue party. There were two Navy doctors, but one was not available to jump and the other was not permitted to.

It was up to me--if I would volunteer to jump. I was the only doctor at hand for the mission. I volunteered; but believe me I was scared. I had scarcely looked at a parachute before. But I thought of great risks many of my medical colleagues were taking in other theaters of war. My time in the Army had been spent in relative security. Foul weather and boredom had been my worst complaints.

I asked for volunteers to go with me, to cook and help make camp. Two captains came forward; one was the chaplain at Cold Bay. None of us had had training or experience with parachutes. Yet we had to jump immediately, before the weather worsened. None of the personnel at Base Operations had ever jumped, or apparently knew anything about jumping, fitting parachutes, or landing. To make things worse, no static lines were available to open our chutes. We'd have to pull the cord. There were no chest chutes to rely on if our back chutes failed to open. Everyone gave us instructions about jumping, how soon to pull the rip cord, and how to land. No two instructions were the same. I knew I should forget everything I was told. I hoped I should remember to pull the cord. I opened the flap on my parachute and read the rigger's card. It stated that the chute had been freshly packed only two weeks before. I felt better.

There was no time to pick and choose medical supplies. We grabbed everything we could. Mostly I wanted plasma to combat shock and hemorrhage, and chemical heating pads. An old medical colleague of mine from Anchorage, Lieutenant Commander Walkowski, helped me into sheep-lined clothing.

"You know, Wally." I said, "I haven't told Gwen about this leave yet. That flight 'p the islands is so dangerous. I was going to wire her from the mainland if I made it that far. Do you think I'd better wire her before the jump?"

"Better wait," he said. "See if you get back in one piece." Wally was very comforting.

We were ready to leave Operations. Lieutenant Estes advised me: "Don't lose that rip cord, Doc, whatever you do, or you'll never be a member of the Caterpillar Club." Whatever that was. I remembered again; I was just a ground-force medic.

Lieutenant Estes was piloting the plane ahead of us. The visibility was good, but there was a chance that wind might carry parachutes over the precipice into Cathedral Valley. That would have done the injured no good, and been curtains for us. Estes drooped a parachute weighted by a can of water to test the wind drift. The parachute never opened. We didn't see the drop from our plane. Later Estes told us he radioed to our pilot, and asked if we had been looking. Our pilot radioed back that we hadn't, and he wasn't going to tell us.

The minutes before the jump dragged. I was jittery. We three volunteers were complete strangers to one another. Suddenly we began introducing ourselves, shaking hands, and trying to talk above the roar of the motors coming through the open cargo door.

The chaplain who had volunteered was Capt. W. B. Mullen, of Dubuque, Iowa. The other officer was Capt.--now Major--F. Scholander, from the Army Air Force Proving Ground Command, Eglin Field, Florida. Like me, he had been in transit. He had arrived at Cold Bay that morning with Sir Hubert Wilkins, the Arctic explorer, in Sir Hubert's plane. They were on a special mission. They picked up radio messages about the crash and flew in to help. Sir Hubert, I learned later, was the expert adviser at Cold Bay for the complicated rescue work which followed.

I detected Captain Scholander's Scandinavian accent over the noise of engines. He had studied medicine at the University of Oslo, but had turned to research work. We discovered that both of us had studied in Stockholm at the same hospital, and we exchanged a few words of Swedish.

The red light at the cargo door flashed on--signal to stand by, ready to jump when a bell rang. Would the bell never ring? I nervously pulled the rip cord on one of the spare chutes lying about, to see how much force it took. The bell rang. Captain Scholander was out like a flash.

Peering cautiously out the door, I saw his parachute fill

with air and open far below. That was one of the happiest moments of my life. His body was swinging like a pendulum, first to one side, then the other. At times he was horizontal, seeming higher than his parachute. He stopped swinging and began a graceful descent to the snow-covered mountain.

The plane circled for another pass. The red light flashed again. It was my turn. My heart pounded. I grabbed the cargo door with my left hand, and the rip cord with my right. An engineer stood behind me to give me a shove if my courage failed. He spoke, "Doc, do something for my buddies on the mountain. They're swell guys."

The bell rang. I jumped, feet first. The slip-stream slapped my face with tremendous force. I cleared the tail and fell into space. I forgot to count one-two-three before pulling the cord. I pulled it quickly, throwing my right arm out as far as I could.

A sudden jerk brought me to my senses. I was hanging in the straps; they were tight about my thighs and chest. The ring of the cord was firmly clenched in my right hand. I swung a little from side to side as I drifted downward. I had a sense of well-being and buoyancy, the clinical word for it flashed through my mind--euphoria.

This wasn't bad, I thought. The chute had opened. God bless it! I laughed. I felt like shouting. It was thrilling to float through space like this. I liked it.

The jagged tops of the Pinnacles and the precipices of Cathedral Valley fell away in the distance. I looked down. An immense smooth snow field lay between my legs. Captain Scholander had landed, a tiny speck below. Fantastically, I wished my friends were enjoying this ride with me. What a story to tell my wife! It struck me as funny that she didn't know what I was doing. I laughed again. I thought of my son. He was fifteen months old now; I had never seen him.

I looked up into the chute. How could such a contraption keep a man in the air? I noticed a large, ragged hole near the top. The fringed edges of the hole flapped. I gave it no more thought. Later I learned that I had pulled the rip cord too soon. The pilot chute and the main chute had caught and torn in the cargo door. The chaplain, who was due to jump next, saw part of my chute open in the plane. He rushed to the door to throw it out.

The engines of planes overhead roared. I looked down

again; the ground was coming up fast. I hit the soft snow and relaxed, and rolled down the mountain.

Well, I thought, I'm all in one piece, anyway. It was 4:45 by my watch. My right hand still firmly grasped the rip-cord ring. Then the fun began. Strong gusts filled my chute with air, pulling it down the mountain, and dragging me along. I remembered I was supposed to pull in the lower shrouds to empty the chute of air. It was easier said than done.

Try as I might, I coulnt pull in the shrouds enough. At times I would have the cloth almost in my hands. Then a strong gust would fill it with air, and down the mountain I would go for another quarter mile. The shrouds slipped in my wet mittens. I threw them off. My hands numbed with cold. I pulled and pulled, until I no longer had strength in my arms.

I relaxed and let the chute drag me. When I tired of skidding on my back, I rolled over on my stomach. I unfastened my chest buckle, but my leg buckles were too tight to be undone.

Far down the slope Captain Scholander was running to intercept me. He grabbed my parachute and spilled it as I was going by.

I got out of the harness, exhausted, and lay down to rest. Scholander went off to help Mullen, the chaplain, who had jumped last, and was also being dragged by the wind.

Planes circled overhead, dropping supplies. The chaplain and I picked up snowshoes, and started up the mountain. "Well, chaplain," I said, "I guess the good Lord was looking after us today."

"Yes, Doc," he said, "I got the message last night, and knew everything would be all right."

A shower of chocolate bars hit me on the head. The aiming of those pilots dropping food was too accurate.

We snowshoed to the wreck, five miles away. The trek took about two hours. Captain Scholander, hastening ahead, arrived first. I opened the cargo door of the fuselage at 6:45 P.M. Three survivors lay in sleeping bags near the door. The ship was filled with cargo, which had shifted forward and lay strewn about. Scholander and the chaplain hauled in

supplies and made camp, while I gave my attention to the survivors.

They presented the textbook picture of persons suffering from shock and exposure. All were conscious, but appeared dazed and apprehensive; they scarcely moved, and spoke only when questioned.

The pilot was in the most serious condition. He was suffering from concussion of the brain and severe shock, having almost bled to death from long, deep cuts on the scalp, lip and right leg. We started giving him plasma immediately. His wounds were treated with sulfanilamide powder and clean dressings and compresses applied. Heating pads were applied to his body, but not to his feet.

When he was strong enough to talk he told me he remembered little about the accident. He had flown the route many times. He recalled radioing to Cold Bay around 8:30 A.M. The altimeter read 2500 feet, and his air speed was 170 miles an hour. Visibility was poor, and he was flying by instruments. His safety belt was fastened. He remembered nothing after that until about three hours later, when he regained consciousness. The plane was upside down, and he was practically standing on his head. The engineer, Sergeant Sundermier, from New Jersey, was cutting him out of the side of the cockpit.

I treated the copilot, Lt. Richard Cocanour, of Merced, California, who was suffering chiefly from brain concussion and shock. His story was similar to the pilot's.

Sergeant Sundermier was suffering from mild shock and concussion of the brain. He had battery-acid burns on his face, neck, chest and shoulders. His clothing, eaten by the acid, fell from his body as I examined him. His fingers were swollen, colorless, and appeared to be frozen. We gave him plasma and attended to his burns. Here is his story of the crash:

"It was about nine A.M. the last time I looked at my watch, and everything was going O.K. I was strapped in the navigator's seat; I always fasten my belt when flying instruments. I came to about three hours later. I was pinned under boxes of freight, I pushed away some of the boxes, and crawled over wreckage to the cargo door, and went outside.

"At first I couldn't think or see straight. I went back into the fuselage to help the others. But no one was making a sound. I saw the radioman pinned down in the aisle, dead.

Then I heard the pilot and copilot moaning and sometimes screaming. I got an ax, went back to the nose, and started cutting out the pilot. He was almost standing on his head. It took me about an hour and a half to get him out. I helped him back to the fuselage and put him in my sleeping bag. I found a first-aid kit and put a bandage around his head to stop the bleeding.

"As soon as I could, I went around to the copilot to cut him out. All the time I had been working on the pilot he was asking me to help him. I got weaker and had to lie down to rest more often. Sometimes I just passed out. It must have taken me two hours to get Cocanour free.

"I took him back to the fuselage. He looked worse than the pilot, so I put him in my sleeping bag, and threw an engine cover over the pilot. While I was working on them I called to the two passengers in the plane, and shook them, and felt their pulse. They didn't move, and I was sure they were dead. I was too cold and sick to get their bodies out.

"To keep me warm I put an engine cover around me. I guess I passed out. It was about six P.M. when I woke and heard the pilot yelling that an airplane was overhead. I fell out the cargo door on my face. I leaned against the fuselage, and wasn't sure I saw the plane. I went back in too cold to sleep. I found two parachutes, and covered the pilot with one, and took the other myself. Then I could sleep.

"We slept until next morning, when we heard another airplane. I went outside and saw a C-45. It dropped one sleeping bag. I was afraid they thought only one of us was alive, and I called the pilot to come out. He was pretty sick, and I leaned him against the plane.

"A C-47 came, and we tried to wave at it. Planes started dropping stuff, and things that weren't too heavy I dragged into the fuselage. I found some rations and got something for us to eat; that was about noon the day after the crash, our first food. More sleeping bags were dropped. We crawled in and slept. More planes kept coming over, but I was too sick to get up. Later I went out, and found a milk can with a note telling us a rescue party was on its way. It was around six P.M. when I saw someone coming up the mountain. I told the other boys, and we sure were all glad. It wasn't long before Captain Scholander arrived."

This twenty-one-year-old boy saved the lives of pilot and copilot by his prompt action, in my opinion. He performed miracles, while suffering from severe shock and exposure.

himself; and he acted with no regard for his own safety or health. If anyone ever deserved a medal, I thought, this youngster did.

In the ensuing days Lieutenant Cocancur and the sergeant made rapid progress. The pilot was critically ill all the time. We labored to prevent him from sinking deeper into shock. He received in all fourteen units of plasma.

The only clear weather we had was the first night. The day following our jump, Tuesday, March twentieth, the weather was foul. We stuffed pieces of parachutes in broken windows and holes in the fuselage, hoping to keep out snow and cold. By morning a layer of snow had shifted over our sleeping bags. But the fuselage of the C-47 was almost intact; and ample supplies were being dropped. We decided to stick with the wreck, and wait for a ski plane. Giving plasma in the biting cold was not easy. The first bottle started to freeze. A "hot box" was made of chemical heating pads, with blankets and parachute cloth for insulation. To have enough for the boys to drink at night, I kept bottles inside my sleeping bag, next to my body.

We wrapped the dead in parachutes, and took them outside. All appeared to have died instantly. Those whose safety belts had been fastened lived; the others were killed.

A slab of bacon was dropped, and we ate it almost raw; our bodies craved the fat for protection against the cold. Captain Scholander used the lavatory in the tail of the plane as a kitchen. He was a remarkable cook, and his good food boosted morale. Previous Arctic experience made him worth three ordinary men.

Tuesday afternoon, the day after we arrived, Maj. George Johnson, air-base surgeon at Elmendorf Field, and two enlisted aid men, Pfc Robert Goodling, and Pfc Leonard Nemhauser, parachuted to the wreck. They had no previous experience with parachutes.

A blizzard blew all day Wednesday. We still hadn't reported the toll of deaths and injuries to the base. A handie-talkie radio that had been dropped to us, didn't work. The storm drifted snow up to the cargo door. Dropped supplies sank deep and had to be dug out.

Failure to get a message through that a ski plane was needed dampened morale. The pilot received three more units of plasma. He continued to be weak, took no solid food, and only small quantities of fluid. He was apprehensive and

restless. As the feeling returned to his feet, they itched and burned, preventing sleep. Twice we gave him small doses of morphine. His temperature rose to 103 degrees, then declined and stayed around 101. The sergeant improved quickly. His chief worry was the front teeth which had been knocked out.

Thursday morning, March twenty-second, we were up early after a cold, sleepless night. The blizzard was still raging. Outside we could see only a few feet. It was our fourth day, and we still had made no radio contact with the outside.

The pilot was somewhat stronger, but he continued to be sick at his stomach, and occasionally vomited. He received three more units of plasma. The two other patients had ravenous appetites. But they were still weak.

Sometimes, when the wind slackened, black volcanic ash from Pavlov drifted over the wreck and the snowy slopes. It made sharp contrast with the snow. We tramped out black-and-white messages with snowshoes; but always the wind rose, and snow drifted over our messages before planes arrived to read them.

Scholander also used green sea marker from the life rafts for writing snow telegrams. I can still see him in his kitchen, bending over the little gasoline stove, his beaming face and rosy cheeks shining in the candlelight; with moisture dripping from his mustache, dyed green from the sea-marking compound, sometimes dripping into C-ration stew. What a man!

That afternoon another handie-talkie was picked up. It worked! Pfc. Goodling heard Colonel Grossmith from his plane overhead, telling us that two dog teams were only an hour away. Major Johnson radioed an urgent request for a ski plane. Colonel Grossmith relayed the message to Anchorage. Presently we heard the dogs barking.

The dog teams arrived with four Alaskan Indian soldiers. They had been flown from Anchorage to Cold Bay, and had then mushed forty miles in three days. Once planes dropped them a rubber boat for crossing a river. These four men anchored a mountain tent to the intact wing of the plane.

Later that afternoon another rescue party of four men arrived. They had navigated an Air Force crash boat from Cold Bay to the bay nearest us. Storms held them offshore eighteen hours. They lost their anchor, and another one, weighing 250 pounds, was dropped on nearby mud flats by plane. Once ashore, they had to walk three days, and wade a river up to their

waists. Dry clothes were dropped to them. At this point in the rescue almost everything conceivable had been dropped. Our family had now grown to seventeen men, including the survivors.

The storm that night was the worst yet, with seventy-mile-an-hour gusts, and we feared the wind might blow the wreck over the precipice.

Friday morning, our fifth day, the storm had not abated. Moving the sick men to Cold Bay in the storm by dog team, or to a beach where they could get aboard the crash boat, seemed out of the question. We decided to wait for the ski plane; and about noon we got a radio that a ski plane was coming.

The pilot received four more units of plasma to fortify him for the trip. Our good chaplain, who had worked hard at camp chores, had also been putting in "priorities" for good weather to "Headquarters." His prayers for good weather were finally answered. The afternoon turned bright, without wind or snow.

A C-47 appeared on the horizon, trailed by a small yellow plane with skis. The ski plane made several passes over the wreck. Erik Schutte, a civilian bush pilot from Anchorage, landed safely on the snow where we had marked out a landing strip. He made three round trips that day, delivering all the wounded men and our original parachute party to a frozen lake near Cold Bay. An ambulance took us from there to the hospital.

I hadn't removed my clothes since the night before parachuting. I bathed, and changed, and ate, and slept. Next day, exactly a week after the accident, I was flying home once more. My leave had been interrupted, but I was on my way to see that son of mine, and Gwen, my wife. Wait, I thought; wait until she hears what her ground-force medic has been doing.

HEADQUARTERS
ARMY AIR FORCES TACTICAL CENTER
ARCTIC, DESERT, TROPIC BRANCH
Orlando, Florida

GMS:hks

13 April 1945

NOTES ON LAND AND SEASIDE SURVIVAL
IN ALASKA AND ON THE ALEUTIANS

Part I

1. From 11 February to 27 March 1945 I was in Alaska and on the Aleutian Islands as an observer of life raft and exposure suit tests which were being carried on by the Physiological Laboratory of the AAF Proving Ground Command, Eglin Field, Florida. Twenty-nine days (19 February to 20 March) of this period were spent with the Eleventh Air Force, principally on the most westerly island of the Aleutian Chain, Attu.

2. On the mainland I was stationed at no other base than Ladd Field, Alaska, but I made a point of getting afield thereabouts whenever possible. By setting out afoot and crossing Chena Slough I was able to get into mixed spruce, birch, alder and aspen woods with little difficulty. Several times, with the help of transportation, I visited Cleary Summit (elevation about 2000 feet) a smooth-topped, not very noticeable mountain about 17 miles (22 miles by automobile) northeast of Fairbanks. On all of these field trips I took with me the Stevens over-and-under gun (.410-.22) which is furnished with certain emergency kits (E-2, etc.). When I first took the gun out for an overnight trip the weather was cold--down to -51° F. at night and -20° to -35° F. by day. During the coldest snap the metal of the thumb selector apparently contracted enough to cause this important part to become loose. Part of it--the short bar connecting the external disc with the inner arm of the selector--actually dropped out and it was only a matter of luck that I saw the loose external disc before it dropped into the snow. This is a serious defect, for without the thumb selector the firearm will shoot only the rifle or the shotgun, not both. All paragraphs in survival bulletins pertaining to use of the gun should call attention to the fact that in extremely cold temperatures the thumb selector is likely to come loose or drop out entirely. In the case I have just reported we were fortunate enough to be able to make a new bar at the machine shop and restore the whole thumb-selecting apparatus to approximately its original condition.



3. The snow was about knee-deep throughout the Fairbanks region—less deep in areas where the wind had had a chance to blow it off, and firmly crusted on open hilltops. While walking across country I wore either QM wool trousers and thick flying trousers with ordinary oxfords and A-6 flying boots, or QM woolen trousers and the A-14 mukluk assembly required in making the trip from Watertown to Ladd Field. I found both these arrangements warm but neither was very comfortable for walking considerable distances, and the mukluk assembly was definitely hard on the ankles. In neither case did snow get inside the boots and my feet stayed fairly dry.

One difficulty should be mentioned: the failure of zippers. In order to get a pair of A-6 flying boots large enough for my oxfords I had to trade in the new pair I got at Watertown for an older pair at Ladd Field. The zipper for the left boot did not work properly and I almost froze my right hand trying to get the zipper to work. It went down so far, refused to come back, then could be pushed a bit farther down, but when I forced it all the way down the whole thing went bad so that not even back at Ladd Field could we make it work. I was told that this sort of failure was common enough at that base--especially with old boots.

4. We saw caribou several times in the Cleary Summit region and could have killed two or three had we had a carbine or other heavy rifle. Unfortunately I was not carrying any .410 slugs with me. Red squirrels were seen frequently; we squeaked these up to within easy range any time we wished to. As for snowyshoe rabbits, we saw innumerable tracks but never the animals themselves. We saw fox, deermouse, bear, lynx, mink, porcupine, and possibly wolf tracks. As for bird life: ptarmigan were quite common at Cleary Summit. They were all in winter plumage. Along Chena Slough the game birds I noted were ruffed grouse, spruce partridge and sharp-tailed grouse. The spruce partridge were living wholly on spruce needles, but the ptarmigan and ruffed grouse were eating cranberries; aspen, birch, willow and alder buds and catkins; and the waxy seed-capsules of the wild rose. The cranberries and wild rose hips we ate, finding them to be quite tasty.

5. Sgt. Norman Bright and I had little difficulty building fires at Cleary Summit. Dead wood was abundant there. We used grass and fine twigs as kindling. We had a good reflector made of 4 green spruce logs.

Part II

6. In the Eleventh Air Force almost all of my time was spent on Attu. During my 29 days there the weather was extremely variable. The typical day was a succession of snow, squalls, sleet storms, willi-waws, rain and brilliantly clear spells. One storm was notable in that it was rated one of the worst on record. Our party became acquainted with this storm personally for we were on the life raft during 18 hours of it. Temperatures on Attu were not severe, however. We were told of one swift drop of the thermometer to 18° F.--a cold spell of the earlier part of the winter. The coldest temperatures we actually recorded were only a few degrees below freezing, 26° F. or thereabouts, and a good deal of the time the air was definitely mild. The temperature of the sea water varied from 34° to 38° F. The whole island was snow-covered, there being only a few naked cliffs, and south exposures on which small birds such as buntings could obtain food. All the mountains were white with a silky appearance caused by the melting of the snow. Two men were killed by a snow-slide while we were on the island. At sea level the snow was about knee deep. Nowhere along the entire shore was there ice of any sort. This made it possible to study the tidal flats whenever we were ashore between sessions with the life rafts.

7. While carrying on our life raft tests and while on the YP-400 we used various hooks, spoons, etc. in catching cod, sculpins, blennies, and flounders. The cove in which our YP-400 was anchored was not very deep, so comparatively little line was required. We soon found that we had almost as good success with spoons as with bait, and we had no success with the pork rind furnished in some fishing kits. Obviously fish had gathered under the YP-400 to which we were attached, for we found their stomachs to be filled with such items as macaroni, etc., which had been thrown from the galley. With simple line, leader and sinker we probably could have caught all the fish we needed--and more.

In the open sea, however, conditions were different. There, using the same apparatus, we failed to get even a strike. Our sinkers would not carry the bait or spoon down adequately and there apparently were no surface-feeding fish present.

On the life raft we found that it was extremely difficult to skin or cut up fresh fish without gravely endangering our hands as well as the fabric of the raft itself. Eventually

we decided to let the fish hang until frozen stiff at which time they could be cut up much more easily. We all ate raw cod, sculpin and flounder, finding it to be quite palatable--but it was better frozen than fresh and slippery.

As for cooking fish caught on the raft: we found that with Sterno heat and a very simple little stove made from a tin can, we could cook quantities of fish with little difficulty. We cut the fish up, emptied a C-ration can, filled the can a quarter full of salt water, and steamed the pieces of fish until they were done. It was possible thus to cook a whole cod, 2 feet long or larger, without adding more water. The soup, incidentally, was delicious.

8. We made one attempt to catch fish in a fresh water stream. Having learned through a Cpl. Comeau of the Air Base that Dolly Varden trout were known to inhabit a brook which flowed into Temnac Bay, we journeyed with Comeau to the pool he had in mind--a deep stretch in which he had seen "hundreds of fish" many times in summer. To our surprise we found the whole valley, stream included, to be buried under snow 2 to 3 feet deep. A few gray areas indicated where the water was deepest or the current swiftest, but no open pool was anywhere in sight. Walking carefully on the soft, slushy ice, we chopped three holes with a heavy crow-bar. The ice was fully 3 feet thick despite its softness. Beneath the ice the water was 3 to 4 feet deep.

Using various spoons as well as bait we fished for more than an hour without success. We didn't get a bite or strike of any sort. Continuing to believe that there were fish in the pool we dug a slot 6- to 8-inches wide and about 20 feet long, across the pool and sunk a gill net. Using hand grenades both above and below the net we attempted to force the fish to swim into or through the net. The fact that we caught nothing convinced us that there were no fish there.

9. To keep the weight and bulk of equipment down, I did not take the .410 -.22 gun with me on any of the life-raft tests, but I could have shot many gulls from the raft and these birds could have been cooked on our Sterno stove. The gun served us well ashore. I had no further serious trouble with the thumb-selector though it slipped out once and had to be put back with care. Because of the dampness and salt water I had to clean the gun frequently and carefully. Once, after it slipped into the sea, I had to give it a thorough washing in hot fresh water.

10. Ashore I was especially interested in investigating

the tidal pools and was much disappointed at finding so few fish there. Small sculpins, 2 or 3 inches long, were discovered, but these did not amount to much as food and we found no blennies in the beds of seaweed. Fishing from the shore proved to be unsuccessful. Had the water been deeper or had we fished from a cliff we might have had better luck. As it was we got nothing, casting from the water's edge. A set-line (which we did not try) might have produced better results.

11. Everywhere along Attu's shore at low tide we found a good deal of animal life, however. Sea urchins were common locally. Live ones were always green but they were at times surprisingly hard to see because they hid themselves in crevices where they were more or less covered with sand and gravel. They were about 2-1/2 to 4 inches in diameter. Looking closely into the pools, it was sometimes possible to discover dozens of them lining a single groove in the rocks. They could be pried up easily with a stick or lifted off with a strong steady pull of the hand.

Their contents were disappointing, however. Cutting them open with a strong knife we found first the fairly clear, dark brown body fluid. This it was possible to pour or shake out with some of the food the urchin had eaten, leaving the five light-colored strips of egg- or sperm-mass clinging to the back. These were obviously the most edible part of the animal, but they were difficult to remove with the knife and did not amount to much in bulk after they were removed. Presumably the egg masses would become much larger later in the season. Sir Hubert Wilkins and I ate the more edible parts of several of these sea urchins, and one evening before dinner we served the egg-masses on crackers as appetizers and found that everyone enjoyed them. However, on two or three occasions I attempted to eat all of the heavier internal part of a sea urchin and found this to be not only unpalatable, but extremely gritty. ADT Branch should give specific directions as to obtaining and eating these animals since they are an important survival item throughout the whole Aleutian area.

12. The black mussels which I found were very flavorful and I believe even the uninitiated would quickly learn to like them. Most of them were small, rather difficult to obtain, and quite difficult to open, however. Along one stretch of shore I made a point of counting the mussels which I could have gathered without wading. Of the 30 some counted, only 3 or 4 were more than an inch long. Obviously these would not have yielded much in the way of food, but they might be all a man could find! After a storm I found another, a much larger

species of mussel, washed ashore on a piece of seaweed. Three of them were attached to one strand of weed. These were not very difficult to open and were extremely palatable. I believe they inhabited deeper water. At any rate, though I searched widely for them, I failed to find any more. As for the various clams—axe clams, heart clams, etc., all that I found were delicious, but they were extremely scarce.

13. The only chitons we discovered were comparatively small (about 2-1/2 inches long) and tough when eaten raw. We found limpets of two or possibly three species but most of these were small and rather difficult to obtain. The largest were on jagged rocks exposed only at low tide and we had difficulty in gathering them because of the breakers. They were all very good in flavor.

14. We succeeded in finding no hairy tritons, sea cucumbers, scallops or crabs. We were especially disappointed in not finding any spider crabs for they were famous throughout the Chain as a delicacy. At Adak we did find them. In fact we had three middle-sized ones for supper and found them to be extremely good. With legs outstretched they measured about 2 feet across. The body of each was about 8 inches in diameter.

15. As for seaweed, I found the rather bright green sea lettuce to be palatable enough, and the so-called sea cabbage I ate on several occasions, but these various forms of vegetable food always made me feel slightly ill,—not sick, exactly, but aware of an uncomfortable taste or feeling. It is admittedly difficult for a person to report on matters of this sort, for on the days when I ate various sorts of seaweed I also ate sea urchins, etc., and I could never be sure exactly what was causing me to feel uncomfortable.

16. Birds (especially gulls, emperor geese, harlequin ducks and sandpipers) were common along the shore, and with the over-and-under gun I would have had no trouble shooting numbers of them. Conditions were not normal, however, because of the quantities of garbage thrown out regularly at Murier Point. Ptarmigan we failed to see anywhere on the Island, though droppings were found at one place. The most noticeable large land bird which could have been used for food was the raven, but here again the species was common only where garbage was thrown out regularly. In areas where other food was scarce birds too were scarce.

17. Nowhere on the island did we find very much in the way of berries on which a man could have subsisted. In a few exposed places there were some shrivelled crowberries. These

were virtually tasteless and probably all but worthless as food. Such plants as the Kamchatka lily, which might have had edible roots, we could not locate because of the snow.

18. We saw several blue foxes which we might have been able to catch or shoot, but we saw no tracks, burrows, droppings or other signs of small mammals such as lemmings and hares.

19. Some of the exposed cliffs were well-covered with lichens of one sort or another, among them a large sprawling species of rock tripe, but unfortunately we had no time to prepare this plant for food and thus to test its food value. The only good specimen of this tripe obtained we shot from the face of a cliff! There was no other way to get it!

20. As for fire-building, our attempts were failures. We found no driftwood. The only kindling was dry grass and the stalks of a coarse weed related to the wild parsnip. Dry reindeer moss would burn a bit and we could get this kindling to flare up, but there was no single item obtainable which would hold fire and establish a good hearty blaze. The snow was deep and wet, of course. In fact, everything was wet. As I tried to get a blaze going I thought of all the paragraphs I'd written on how to build a fire and it seemed to me I could hear derisive laughter in the wind! It must be borne in mind, of course, that during our stay on Attu the snow was unusually deep.

Summary

After my stay on Attu I feel that the ADT Branch may well place less emphasis on the whole subject of living off the land. There I was--a naturalist with a gun and ammunition, yet not once did I see a ptarmigan. I was on the lookout for natural phenomena whenever I was afield, yet I completely failed in my search for lemming burrows, tracks, or droppings. Because of the deep snow I found no Kamchatka lilies, no bistort, only a few miserable berries. My attempts to build fires, using lichens, 'dry' grass, wild parsnip stalks, etc. were pitiful. The black mussels I found were small and not easy to open. The sea urchins proved to be shell, spine and inedible body-liquid principally, with only a bit of palatable matter in them. I found no crabs. I found no fish in the tidal pools. I didn't even see a fish in one of Attu's better known trout-streams!

Survival information is good. We of ADT Branch must go on handing it out. There are times when even a hunk of help

or handful of shrivelled crowberries are better than nothing. But we will do well to bear in mind that there is nothing romantic about a fight with genuine starvation; that eating sea urchins because you have to eat them is no picnic; and that flying personnel in general cannot adjust themselves to a liking for living in the wilds as promptly as we.

s/ George M. Sutton
t/ GEORGE M. SUTTON
Major, Air Corps

ARMY AIR FORCES
STATION NO. 13, ATC, APO 976
c/o FM, MINNEAPOLIS MINNESOTA

15 June 1944

SUBJECT: Report of M and K Rescue Trip.

TO : Commanding Officer, Station No. 13, ATC, APO 976,
c/o FM, Minneapolis, Minnesota.

1. The following is a report of the M and K rescue expedition:

At 0030, Friday, 2nd June 1944 the tower informed the C.O., Lt. Bledsoe, of a radio communication just received. A Spartan airplane owned by M and K and piloted by E. F. Bowman was preparing for a forced landing ten minutes flying time southwest of Northway. No further word was received. It was later learned that the ship was carrying three passengers; L. E. Steelman, Jerry Noonan, and Curtis Clark. At 0100 a Travelair, piloted by Gran Collins, landed at Northway. Pilot Collins reported having sighted the wrecked ship. He expressed the belief that there were no serious casualties. However Collins volunteered to fly back to the scene of the accident and make a closer observation. For this purpose, accompanied by Carl Cockriel, he took off at 0200. Upon arrival at the scene of the crash it was obvious that the situation was more serious than he had thought. He determined to risk landing his ship in order to give any possible aid. Collins planned to wash out the landing gear but the plane hit some soft gravel and turned over. Neither was hurt in this mishap. In a short while Collins had his radio out of the disabled aircraft, set up on the ground and working. Northway Airport was then in direct contact with the scene of the accident.

In the meantime arrangements were made at the airbase for an overland rescue expedition. The party consisted of Pete Charlie an Indian guide, who traveled that country, an Alaska Fire Warden Doc Cripes, two cat skinners, Charles L. Viland and Andrew Loomis, three army personnel, Lt. Moore, T/Sgt. Herdt and Sgt. Keating.

The equipment consisted of one caterpillar tractor towing a "go-devil" and two T-15, light cargo carriers. The army also took along two walkie-talkies to communicate with aircraft helping in the rescue.

After much difficulty the Nenana River was crossed and at noon on Saturday the party was on the way. Travel was exceedingly slow being about two miles per hour but never the less it was much better than walking, as several of us found out later.

All went well until 2:00 when the cat got stuck in a small but deep stream and it wasn't until 0100 that we were able to ford this. The expedition continued on its way til 1000 the next morning when about five miles from the scene of the accident one of the T-15s threw a track. T/Sgt. Herdt and Sgt. Keating remained overnight to repair the vehicle and joined us later at the camp.

Meanwhile, the cat, upon arrival at noon, was refueled and immediately started to cut a landing strip so that supplies could be brought in and the injured taken out. By 2000 the strip was large enough (25 feet by 900 feet) so that the first plane, a Pilgrim piloted by Herb Haley could land. Mr. L. E. Steelman had the worst injuries, a compound fracture of his left leg and was the first to leave. With him went Capt. Eames, the doctor from Fairbanks, who parachuted to give aid.

The second ship in was a Taylorcraft, piloted by H. A. Bowman, the Spartan pilot's brother. The ship brought in some much needed food and stayed overnight. From then on ship shuttled back and forth bringing supplies and evacuating injured.

All the next day the runway was worked upon until it was 40 feet wide and 1500 feet long and much smoother.

After the dismantled Travelair was brought to the landing strip site preparatory to overhaul and flyaway the party broke camp and started home.

The cat carried the smashed engine of the Spartan and the T-15, which had thrown a track and good time was made until return to the same creek that caused so much trouble on the first trip. Both vehicles became stuck and a message was spelled out on the ground asking for a large D-8 caterpillar. This arrived eighteen hours later and pulled us out of the creek.

While waiting for the arrival of the D-8 we pulled the T-15 out and readied it for the return trip. All parts had to be dried, another carburetor and electrical parts were added. The next morning Lt. Moore and Sgt. Keating left and after eight miles of travel threw the left track at the same time getting stuck. It was impossible to move without the track and impossible to put back the track without moving so Lt.

Moore and Sgt. Keating decided to walk back to the party and come in with them.

At 2200 all were realy to return and after reaching and repairing the disabled T-15 an uneventful trip back to Northway was made.

RICHARD C. MOORE
2nd Lt., Air Corps

SEARCH FROM GALENA

An eight-day search for another civilian aircraft not only ended in failure but also provoked a complaint from the civilian pilot on the efficiency of the Army Search and Rescue system. This pilot, who was engaged in delivering a small plane from Galena to the Arctic Circle Exploration Company at Candle, Alaska, had been at Galena for several days because of mechanical difficulty. When the engine was fired he took off, landed on the Yukon at Galena village, refueled, and started on his trip westward. He did not bother with such minor matters as weather briefing, reports, forecasts, and filing clearances for airways flights, but proceeded in a westerly direction and disappeared from sight. The next day, March 28, CAA notified Fairbanks Search and Rescue that the plane was missing and requested aid. Without any notion of where the plane might be, as no radio contact had been established, seven Army planes and two civilian planes began a search of all probable areas. The area of search was gradually widened until all passes through the mountains from the lower Yukon to the Kobuk had been covered, but all efforts were unsuccessful. The search was abandoned on April 3rd; twelve days later, on April 15th, the pilot and his mechanic walked into a reindeer herder's camp about 100 miles west of Candle, and in due time voiced his opinion of Army Search and Rescue, an opinion which was printed in the Fairbanks papers.

The criticisms naturally prompted ALSD to investigate, and the investigation resulted in a letter from ALSD to CAA in which it was pointed out that

"While it is unfortunate that Mr. Burkhardt and his pilot were lost for a period of some 20 days, it is believed that such inconveniences...were purely the result of their own carelessness and lack of compliance with regulations as outlined by the Army and CAA....As you are of course aware, it is not required that Army Search and Rescue undertake the locating of missing civilian aircraft, and as you are equally aware, they have at all times been more than willing to cooperate in any searches within your region. This however, does not in any way relieve the pilot of the responsibility of adhering to proper procedure nor should it give him the impression that he is at liberty to wander indiscriminately around the country, feeling that should he become lost, Search and Rescue will immediately

set out and locate him... Such facilities as the Army possess will continue to be used in cooperation with your department, but it is sincerely hoped that pilots will in the future show some small measure of appreciation by at least complying with your regulations."

* * * * *

FLIGHT "D" SEARCH AND RESCUE
1466th AAF Base Unit
Alaskan Division, ATC
AFO 938, c/o Postmaster
Minneapolis, Minnesota

S&R/RCR/glt

- 26 September 1944

R E P O R T O F O P E R A T I O N S

I. Factual Data.

1. Clearance.

a. C-47 #5738, Pilot Probstle, Northwest Airlines Contract Carrier, with 16 passengers, passenger listed attached, and crew of three, cleared U.H.Q. on instrument clearance, copy attached, for U.F.X., flight altitude 11,000 at 16:12z, 18 September 1944.

2. * * * * *

3. Communications Enroute.

a. Aircraft #5738 reported in the vicinity of Talkeetna at 17:38, requesting change of flight plan from 11,000' to 9,000', stating he was on top of the overcast. Request was approved. At 17:42, aircraft #5738 called Talkeetna (A.O.) and requested the radio homing station to give him a continuous carrier. Carrier was turned on and the aircraft's engines were heard over the station at 17:44. No further communications were received.

b. Upon first notification that #5738 was overdue enroute, D/F net, 11th AFSC, was alerted by Operations, Elmendorf Field. F.C.C. Monitor Station, Fairbanks, Ala, was alerted and requested to monitor 500 kcs. and 2992.5 kcs. at 19:15z, 18 September 1944 by Operations, Ladd Field.

c. Monitoring of 500 kcs. was continued until the aircraft was located on 21 September 1944. No emergency signals were received by monitor stations.

6. Aircraft #5738 did not carry parachutes.

II. Descriptive Data.

1. Alerting of rescue system.

a. Rescue system, 11th AFSC, was alerted by Base Operations, Elmendorf Field, at 19:15z, 17 September 1944.

b. Rescue Flight "D", Ladd Field, was alerted by Base Operations, Ladd Field, at 19:15z, 18 September 1944, and basic factual data listed under I, above, reported. Factual data of clearance and subsequent information was received at 19:15z, and information concerning reports of weather and the hearing of the aircraft by section foreman, Alaska Railroad stations at Chase, Curry, and Gold Stream, were forwarded by Base Operations, Elmendorf, as received.

2. Search Operations.

a. Rescue Flights "C" and "E" were alerted, and AT-11 aircraft, both flights, requested to assist in search 19 September 1944, AT-11, Flight "E", arriving in the evening, 20 September 1944, and Flight "C" arriving the morning, 21 September 1944. Both flights were delayed by weather. Flight "E" was also delayed mechanically.

b. During the days 18 September 1944 and 19 September 1944, the area, Healy to Broad Pass, was closed by weather, and all search on those days proceeded out of Elmendorf Field. Aircraft of the 11th A.F. Instrument School, and Base-stationed aircraft participating, covered the area Anchorage to Broad Pass except for certain high ground along the Talkeetna Mountains and in the Alaskan Range, which was cloud covered.

c. Reports of possible clues in the vicinity of Lane, on the Alaska Railroad, and Nenana, were investigated on 19 September 1944 and discontinued upon investigation. Weather improved during the night, 19 September 1944, and searches from Elmendorf and Ladd Field were coordinated to provide maximum coverage during the day, 20 September 1944. All the effected areas from Big Delta on the East to Mount McKinley on the West and from the North slope of the Alaskan Range to Elmendorf Field on the South were covered by search planes with no results.

d. Several search aircraft reported receiving signals and carrier wave on 500+ kcs. while searching in the area.

These signals were discredited as being of emergency nature by the F.C.C. Monitor Station, Fairbanks, and indicated to have come from known Japanese and Russian ship-to-shore radio sets.

e. Intensive search of special areas believed to be most likely was initiated on 21 September 1944 and coordinated between Elmendorf and Ladd Field search units to avoid over-concentration of aircraft in search area. This search was terminated by the location of the wreckage of C-47 #5738 at approximately 20:00z, by Pilot Allan Kirkpatrick, Northwest Airlines Contract Pilot, flying on scheduled cargo run. Aircraft wreckage was located at $150^{\circ} 37'$ Longitude, $63^{\circ} 35'$ Latitude, on the unexplored area at the head of Eldridge Glacier on the north-east slopes of Mt. McKinley among the Great Serags.

3. Support Operations.

a. Upon notification of location of the wreckage, all search aircraft were recalled, and aircraft of Search and Rescue Flights "D" and "E" were equipped with supporting supplies, shelter, sustenance and medical, to supply any survivors. Capt. W. N. Farnes, M.C., Parachutist Flight Surgeon, and Capt. D. C. Gregory, M.C., Parachutist Flight Surgeon, Search and Rescue Flights "D" and "E", respectively, were prepared to parachute to the aid of survivors. L-1 aircraft from Flight "D" were dispatched to Summit to stand by for instructions.

4. Evacuation.

a. Wreckage of #5738 was kept under surveillance by aircraft from Elmendorf Field and from Ladd Field from 20:00z, 21 September 1944 until 03:00z, 22 September 1944 to determine the possibility of survivors. It was the weighted opinion of observers and surgeons who participated in the surveillance that there was no possibility of survivors. Surveillance was maintained throughout the day of 21 September and photographs were taken at closest possible range, enlarged and studies for signs of survivors without finding the slightest sign. It was therefore presumed that any persons who survived the initial crash and the 1700 foot fall that followed, had not been able to survive the three days and three nights that elapsed before the wreckage was located, the temperature there being -10° to -15°C .

III. Remarks.

1. Coordination and cooperation within the station and between stations was very good. Some time elapsed after call was made for AT-11 search aircraft from Whitehorse and Nome until their arrival. This has been justified on mechanical and weather causes.

2. Equipment Used.

a. Search aircraft used were AT-11, AT-7, B-25, B-24, and C-47 types. It is noted again that the AT-7 and C-47 aircraft are not suited to search missions due to their poor forward and downward visibility. The AT-11 aircraft were found deficient in performance while carrying their search and support equipment when the mission required them to operate above 10,000'. It was further noted that too much time of the available daylight was lost in the case of the AT-11 aircraft returning to base to refuel. Search areas were 100 to 150 miles from base at 1466th AAF Base Unit, and required climbs to over 10,000' crossing the Alaska Range. Thus from 200 to over 300 miles of the search capacity of the aircraft were lost twice a day due to lack of range. Aircraft bomb bay can carry an additional tank for direct feed to the left main tank, and a weight of approximately 350 lbs., can be added. It is desired to develop a bomb bay tank to carry 50 gallons additional fuel for these aircraft assigned Search and Rescue Units of this Division.

b. Upon notification that the objective of the search had been located, I-1 land and seaplane rescue aircraft were dispatched to Summit to stand by for instructions. Air rescue was not needed, and the aircraft returned to Ladd Field 22 September 1944.

c. It is estimated that a successful seaplane landing could have been made during the early morning 22 September 1944 at or near the scene of the wreck had conditions justified such action. Parachutist flight surgeons were on hand at the site in AT-11 #7665 and AT-11 #7659 shortly after its location, but did not jump since air currents and wind were such as to make this action probably unsuccessful and since there were no signs of life and no reasons to expect survival.

d. Remark is made that during the search and after the location of the wreckage, while all search aircraft having Radio Compasses were guarding 500 kcs., numerous reports of signals on 500 kcs. were received. Signals received included continuous carrier waves and code messages, some of which were reported to be SCS signals. The F.C.C. Monitor

Station, Fairbanks, reports that these signals were heard and identified as ship-to-shore communication in the area west of the Bering Sea, on 505 and 520 kcs. No signals identifiable as emanating from the "Gibson Girl" have been reported.

/s/ R. C. Bagle
R. C. BAGLE
Major, A.C.
Rescue Officer Sector "B"
Alaskan Division, ATC

A CERTIFIED TRUE COPY:

/s/ Edwin R. Carr
EDWIN R. CARR
Captain, Air Corps

SURVIVAL INCIDENTS

1. Case of Lt. J. E. Vaughn, deceased. On March 31, 1947 while engaged in ferrying a P-39 plane to Fairbank, Lt. Vaughn became lost and finally made a forced landing about 10 miles west of Hay Lake, about 110 miles northeast of Fort Nelson which is on the regular route. His body was found by an Indian sometime in late May and the discovery was reported a few days later. Official reached the scene about May 26th. The weather at the time of mishap was apparently poor but Vaughn had made a successful landing and his body showed no evidence of injury. He had apparently starved to death. Insofar as could be told, Vaughn never moved more than 150 yards from his plane during this whole time. His sleeping place was only 10 feet from a toboggan trail and the nearest habited place was about 10 miles away. He had his parachute emergency pack and all the equipment in the plane which now is considerable though it may not have been so complete at that time. He had eaten all the emergency food he had but insofar as could be told had made no effort to get native foods of any kind. Vaughn's flight leader had landed safely at Hay River but the search for Vaughn had been unsuccessful though vigorously pursued for a considerable time. Vaughn's previous history along this route would seem to indicate that he had a facility for getting lost. Additional information on this case can be obtained from Major Westover at Edmonton or from Corporal K. C. Alexander of the British Columbia police stationed at Fort Nelson, B. C.

2. Case of Captain McWilliams and 16 others, 12 deceased. In late October of 1943 Captain McWilliams was "slow flying" (i.e. putting in time on a new engine) a B-17 out of Whitehorse. He had 16 passengers including several mechanics from the field who had gone along for a ride. The plane became iced up and a forced landing in Lake Bennett (see any good map of the Yukon) was made about 600 yards from Carcross village in 80 feet of water. The ship had a life raft but no attempt was made to launch it and no ditching procedure was followed at all. All men emerged safely from the plane and stood on it until the plane sank in a very short time. It was later discovered that one man who drowned had suffered a skull fracture and one other who was rescued had broken both wrists. All others were uninjured. Some of the crew tried to swim ashore, apparently all of these drowned. Others remained near the site of the sunken ship and merely kept afloat by paddling or by getting air bubbles in various parts of their clothing. Rescue boats were immediately sent out from

Carcross, only 600 yards away but only 5 out of the crew of 17 were saved; among those who perished was Captain McWilliams, the pilot. This incident has aroused interest in the ditching procedures and it is now felt that cargo ships carrying passengers should all have standard ditching procedure on this run as the lakes in this country afford some of the best places for forced landings. The water in all such lakes is cold. It is now understood that the life rafts have been taken off all these planes, but the reason for this is not clear. Major Westover in Edmonton or Captain Boree at Whitehorse, a survivor, could furnish more information on this incident. Also see Captain Jones' report on the same matter.

3. Case of Delos R. Carpenter. This incident has already been reported by Roy Jones and the following notes are merely offered as possibly supplementing Captain Jones' earlier report. Carpenter left Fort Nelson at 1742 GCT on 6 Dec. 1943 as wing man in a 2 ship flight of P-38's. The flight leader went through a hole in the overcast at about Smith River and made a safe landing at that port. Carpenter elected to stay above the overcast and subsequently got lost and came down on a lake about 120 miles north of the Smith River strip in rough mountainous country on the flanks of the Mackenzie Mountains. He was subsequently able to make a radio contact with the AAC station at Watson Lake but had no idea as to where he was and no bearing could be obtained on his signal. He was located on 7 December at 2100 by a C-47 in the extreme northeast quadrant of the Smith River range at just about the outer edge of the area blocked out for search. Carpenter had made a belly landing and was uninjured. His plane had broken through the ice which was only a couple of inches thick but the wings had kept it from sinking. Carpenter himself had broken through the ice while getting ashore. Emergency equipment was dropped but several loads went through the ice or were not recovered by Carpenter who did not want to venture onto the thin ice. One load dropped on shore was recovered so he did have ample rations and equipment. The temperature was reported to be extremely cold by the rescue pilot Lt. Ritenour. Lt. Ritenour flew a stripped down Norseman on skis into the lake on December 8. He departed Watson Lake at 1810 GCT and returned with the victim at 2355. The lake was about 3500 feet long at the most and situated in a narrow valley in mountainous terrain. There were open patches of water showing that the ice was thin. When Ritenour landed his right ski broke through the ice but by gunning the motor he was able to make a small sandbar in safety. On take-off he got a run on this bar and turned onto the ice only at the end of his run. There was little snow covering the ice. Carpenter broke through the ice again getting into the rescue ship. He had made an attempt to set

up camp just like in "Land and Live in the Arctic" and had obviously profited from seeing that film and from his briefing. However, he was in bad mental condition when rescued and did not take the adventure any too well. He was uninjured in the crash but had a bad cold which made things somewhat unpleasant. He was given routine hospitalization at Watson Lake and recovered in a short time with rest. He had constructed a shelter from the parachute to begin with and later used the tarp dropped in an emergency kit. Lt. M. T. Ritenour, the rescue pilot has been warmly commended as having done a fine job of piloting the rescue ship. Carpenter is now reported to be ferrying P-17's in the states. An aftermath to this incident occurred on or about February 29 when two men were killed in a crash at Carpenter Lake. They were engaged in salvage operations connected with Carpenter's ship. So even here, though the original victim was saved the incident eventually cost the lives of two men.

4. Case of Lt. Col. Roberts, Major J. B. Uhlrich and 5 others. These seven men were en route in a Norseman, C-64 on a routine inspection trip to Norman Wells. They ran low on gas and made a forced landing on wheels on 28 November 1943 about 100 miles south of Simpson on a small frozen lake. They were able to operate the plane radio by running their engine and contact was made with Fort St. John. However, they estimated their position about 125 miles from where it really was. This and poor visibility hampered the search. The plane was well equipped with emergency equipment including sleeping bags and rations. Also on board was a Gibson Girl radio which these men were unable to get into operation despite the fact that they were largely a group of communications experts. The grounding of the set was apparently the problem and this has since led to some experiments at Edmonton with the result that a SOP has been worked out for winter use of the Gibson Girl which is now carried on all ferried craft along this route. The group was finally located and rescued on 30 November after being out for two days and two nights. The rescue simply consisted of flying in fuel for the plane which then took off. At the beginning 3 C-47's and 3 Norsemen were on the search. Later 6 more Norsemen were added. Temperature at time of rescue was between 14 and 16 below zero. No one was injured or suffered any bad effects. Their emergency rations were sufficient to last for about a week and they had already started rationing them. Proper use of the Gibson Girl radio which could have been used for homing by the rescue ships was pointed up by this incident.

5. Case of Lt. Don E. Billings. This man is now coming up the route according to notes here in operations and I shall

attempt to see him personally. In the meantime here are a few notes on the matter. Lt. Billings was engaged in ferrying an A-20 when he ran out of gas owing to a mechanical failure of the plane pump system? ? . He bailed out about 75 miles southeast of Fort Nelson on 27 October 1943. He made a radio contact with Fort Nelson before bailing out telling that he was short of gas. He stayed near the scene of the accident for a while but soon moved far enough to find a cabin where he spent a night. The next day he moved farther down a trail and found a well-stocked cabin with radio and all comforts of home. He later fired a shot here which attracted the attention of some trappers who came to investigate. They subsequently led him most of the way to Fort Nelson where he arrived about 6 days after going down. He had sighted some rescue skins and fired flares at them, but was not seen. Major Westover seems to think this may have been because he did not get into an opening and further probably shot the flare when the ships were directly overhead. Billings had his parachute kit and got some moccasins from the trappers who also provided him with some food. He also shot a rabbit with his 45 but reported that no piece big enough to eat was left. A fact discovered here was the contamination of the rations by the camphor heat tablets. The rations were so impregnated with camphor that they made Billings sick. Since then such heat tablets have been left out of all emergency kits on this run by orders from Wing Headquarters. The climate was relatively mild and no ill effects were experienced by the victim. Major Westover seems to feel that Billings did not make much effort at night to keep a large fire burning. See Captain Jones' report for further details.

6. Case of Van Nostrand and Collins. On 11 February at about 1300 (Great Falls Time) 2 P-39 planes being ferried to Alaska collided in mid-air over the Big Delta area near Fairbanks. Both pilots bailed out and landed safely near their planes both of which burned. The pilots were Lt. S. E. Van Nostrand and Lt. J. L. Collins both of the 7th Ferry Group ATC stationed at Great Falls, Montana. This account was obtained in a personal interview with Lt. Van Nostrand at Great Falls on 18 February 1944. Van Nostrand appeared to be a very intelligent chap who cooperated in every way possible. He and Collins came down about a mile apart, both uninjured, and walked far enough to get together. They then located a small clearing near the planes (1/2 mile) and went there. By 1700 (Great Falls Time) they had been located by searching planes and equipment was dropped. Collins had his B-4 parachute back pack and Van Nostrand had a back pack which he had modified to include the following: light ski parka, 2 pair heavy socks, Navy flare gun and 12 flares, 1 chamois face mask; winter

flying helmet complete (?) first-aid kit, folding machete (reported most useful item), jackknife, compass, fire sticks, 5 or 6 candles, T.O. on Arctic operations, sun glasses, 2-D bars, woolen mittens, head toque, one R.R. flare, 2 water-proof match containers with matches, 5 books of paper matches, buffalo skin mukluks, signalling mirror. Sleeping bags, snow-shoes, mukluks, socks, felt boots, mittens, mitten shells, mess kits, cups, knife, fork, spoon, flashlight, K rations were dropped at about 1700 on 11 February. Also got note directing them what to do on next day. They built a windbreak and a tepee from the parachutes attached to the dropped boxes. On the next day they moved down the hill on snowshoes into a valley where they were picked up by dog teams sent out from Birch Lake. The dog teams carried them 10-12 miles over rough country to Birch Lake from which they were flown to Fairbanks by a Norseman operating on wheels off the ice.

It should be noted that they apparently attracted the searching planes by shooting off three green flares which went about 75 feet into the air. Weather at the time of the crash was C.A.V.U. and not too cold on ground. i.e. 5°F (min) to 20° or 30°F (max). About 1 1/2 foot snow on ground, but none fell while men were down. A B-25 (with radio not working) saw the planes fall and reported on landing at Fairbanks. They were just about on course. Men were picked up by dog teams at about 1400 on 12 February after snowshoeing 2 miles. Arrived at Ladd about 1900 (Great Falls time) on 12 February having crashed at 1300 on 11 February. Van Nostrand praised rescue. No ill effects for either man; Van Nostrand emphasizes need for small foldable mukluks that could be put in back pack as Gaffney (fleece lined) boots are no good on ground. Says cold weather test had rubber soled (light) mukluks which looked good. Van Nostrand likes survival dope in Air Route Manual.

7. Case of Major Wheeler, Commanding Officer of Fort Nelson Air Base. Major Wheeler was flying an L-1E on December 8, 1943 as part of the mission searching for Lt. Carpenter. His engine cut out suddenly and he crash landed in densely wooded country 5 miles south of the Smith River Airfield, British Columbia. Major Wheeler was uninjured and was located about 11 o'clock that night by search planes when flares were fired. Major Wheeler stayed at his plane and was rescued on December 9 by a foot party from the Smith River field. This party took 8 1/2 hours to cover the 5 miles between the field and the crashed plane. They were guided through the dense timber by an airplane circling above. The return trip took about 7 hours and was completed on December 10. This rescue was under the direction of Major Westover. It serves to indicate the extreme difficulty in travelling through heavily timbered areas in this region.

8. Case of Lt. Kent, presumably deceased, of the 7th Ferry Group. Lt. Kent was flying a P-39 to Fairbanks in October, 1943 when he disappeared somewhere northwest of Whitehorse. The weather was bad at the time Kent disappeared. A scar on a mountain near Whitehorse is thought to be a possible site of this crash and will be investigated when conditions permit.

9. Case of Colonel Mensing, with two other crew members and 8 passengers. Colonel Mensing and party cleared Fort Nelson southbound in October (?), 1943 in bad weather (?). No trace of the plane has ever been found and it is assumed to have crashed, killing all personnel.

10. Case of Lt. Joe Donahue. Lt. Donahue was ferrying a P-39 in the mid-winter of 1943 when his engine cut out and he made a successful forced landing on the ice of Baker Lake, 20 miles on course east of Watson Lake. After Donahue was down he radioed in his position to Watson Lake and rescue was started. Additional emergency supplies were dropped from a C-47. Donahue, uninjured, had a sleeping bag in his plane and slept on the wing in 40° below zero weather with no great discomfort. He wished to stay by the plane and was too far from shore to set up a camp there. Donahue was rescued about 24 hours after landing and suffered no ill effects. For a much more complete account of this incident see Captain Jones' write-up. It illustrates the value of lakes as landing spots and the use of radio in aiding search.

11. Case of Lt. L. R. Daitz. In late September of 1943 Lt. Daitz and four enlisted men in a Norseman were flying on a search mission near Ruby. They eventually became lost and bailed out when their gas ran low. All landed safely and gathered at the ship which had turned over but was not too badly broken up. They put up parachute-tepees which helped to attract the attention of searchers. Equipment was dropped, and they walked out to Poorman guided by notes dropped from planes. They were flown out of Poorman in an L-1.

12. Case of Lt. Blair. In middle June of 1943, Lt. Blair was ferrying an A-20, when he disappeared between Fort Nelson and Watson Lake. He was last seen flying into an overcast when his wing man turned back because of icing. No trace of Blair or his plane has ever been found.

13. Case of Lt. Leon Crane, Co-pilot of Cold-Weather Test B-24 lost on feathering test on 21 December 1943. Lt. Crane bailed out of the ship when it went into a spin. Crane jumped at between 10,000 and 15,000 feet. The only other man

he actually saw out of the ship with an open parachute was Sergeant Pompeo, companion of Colonel Carr on a previous survival incident in Alaska. The ship caught fire at about 5000 feet and exploded when it hit the ground. Crane estimates that he landed 10 miles from the place where the plane crashed. Crane was uninjured. Upon landing he laid out an SOS signal on the snow with spruce branches and then headed downstream in snow about knee deep. He eventually came to Charlie River and followed it until evening when he made camp with a fire. The next morning he made another SOS. Crane stayed at this place for 3 or 9 days using his parachute as a sleeping bag and getting water from an overflow in the river. No search planes were seen during this period, so Crane decided to move on. After one-day's travel he came to a cabin with a cache of food which provided him his first nourishment since landing. Putting some raisins from the food cache in his pocket, he travelled about one day and one night before running out of food. He then returned to the cabin where he stayed about three weeks. He estimated the food supply to be sufficient with careful use until about mid-April since there was 25 lbs. of flour, 30 lbs. of rice, about the same amount of dried beef, and beans, a few cans of dried eggs, some onions, and other vegetables. A sleeping robe was found in the cabin.

Crane finally made a small sled to carry his supplies and started downstream again. About half way to the stream's mouth he abandoned the sled and put the supplies on his back. Another small food cache was found at this point. He rested here for two or three days and then continued. He eventually came to markings on a frozen river which had the appearance of a marked-out landing area for planes. Here he met a trapper, Albert Ames, who lived nearby with his family. Crane spent two nights here and got some new mukluks from Ames. On the third day Ames started with Crane for the mining camp of Woodchopper about 40 miles away. This journey took two days using snowshoes and a dogteam. The night after Crane arrived a plane piloted by Bob Rice of Alaska Airlines arrived and took Crane back to Fairbanks. The fate of the other men in the plane remains unknown. There seems a fair chance that Sergeant Pompeo may still be alive. This incident illustrates the value of cabins and caches in interior Alaska and the fallacy of staying too long in one spot without food. Apparently, no attempt was made to obtain native food.

14. Case of the C-40. A C-40 plane making the regularly scheduled mail run between Whitehorse and Fairbanks was reported missing in the late morning of Sunday, March 5. It had last reported in when near Snag with everything apparently normal. Later in the day the plane was discovered down on a

small frozen swamp about 18 miles east of Wellesley Lake. It had made a forced landing but was undamaged, and the men were uninjured. The men and the mail were evacuated the next day by L-1's on skis. Later on the C-40 itself was flown out after a runway had been repaired.

This illustrates well the successful use of lakes for emergency landings in winter and of small ski planes for rescue work.

General Notes: — Statistics show that most accidents on the interior route to Alaska have occurred between Fort Nelson and Kluane Lake. This is probably due both to weather and terrain.

The matter of obtaining reliable up-to-date survival stories was taken up with Major Pell, A-2 for the Alaska Wing. He suggested that the Security and Intelligence Officer at each base should have as one of his duties the task of interviewing all survivors. At present such interrogation is performed by Operations and recorded on their form 14. Naturally, many things of interest to ADTIC are not taken up by Operations, and their records are not always easily available to outsiders. Major Pell approved of the present ADTIC questionnaire and suggested that the following questions be added:

1. Was pilot experienced?
2. How many hours?
3. Was flight leader experienced?
4. How many times over route?
5. Were sufficient number of daylight hours allowed?
6. Had pilot had previous trouble with plane?
7. Had pilot been properly briefed?
8. What search procedure was followed?
9. What organizations were involved in the search?

These questions are not all on matters of interest to ADTIC and are obviously designed to check on Operations, but it seems that we could afford to cooperate with Major Pell to the extent of including his questions.

The general idea would be to have the Security and Intelligence Officer at the nearest post, or the one contacting the survivors first, fill out a questionnaire of our design, copies of which could then be sent to ADTIC. Major Pell seemed to think this could possibly be arranged through Air Intelligence, or through the Security and Intelligence Section of ATC. Failing that, he thought it might be possible to make a satisfactory arrangement for interrogations on the Alaska Wing through his office.

General Notes on Emergency Kits: — Gora Field, where the ferry pilots get their equipment, reports that they now have plenty B-4 parachute kits and even still have some B-2 kits for distribution. The pilots are encouraged to modify these kits as they think best or upon the advice of more experienced men. In the pilots' briefing room a sample kit with suggested modifications is on display. In this kit the hand flares are removed, and the new Navy flare set is substituted. This set consists of a small, light hand detonator and 16 flares of 10-gauge-shotgun-shell size, 4 each white, red and green. This Navy outfit is considered better than anything of similar size yet produced by the Army. In forested areas some means of getting signals above the trees is essential. The leather gloves are also removed and mittens, wool, trigger finger are substituted. A chamois face mask, canned heat, a burner for same, and the T. C. on Arctic Operations are put in, the latter solely for the survival section therein. The camphor heat tablets are taken out on order of Alaska Wing Headquarters as the rations in the kit were found to be so contaminated with camphor that they made Lt. Billings sick during his sojourn in the wilderness along Liard River (See Survival Incident #5). In addition to the above changes, most pilots cut out a good deal of the padding in the kit and add a variety of things such as extra matches, soxs, hand axe, lighter fluid, candles, shot-loaded 45 shells, and even part of a sleeping bag. (See Survival Incident #6, following, for a list of equipment added to a parachute kit by Lt. Van Nostrand). According to Major Westover who has tested them the shot-loaded 45 cartridges are not satisfactory. Beyond 20 feet the pattern is too dispersed to do much good and at 20 feet or less where the pattern is better the over-all effect is somewhat similar to shooting a slug as it has been found that the shot penetrate a spruce board about 1/2 inch while the paper wad penetrates about 3 inches. Mr. Peterson from Wright Field suggested that a little careful cutting of the paper wad with a knife before firing might remedy this. Lt. Billings killed a couple of rabbits at close range with his 45 using ordinary slug ammunition. In both cases he says that no piece of the rabbit large enough to eat was left. About all he could find was some bits of fur, gristle, and bone. This may be a bit exaggerated, but at least indicates that ordinary 45 ammunition used at a range close enough to assure any degree of accuracy is probably unsuitable on small game. Many pilots carry their 45 and a hunting knife in a specially designed shoulder holster.

People at Gore Field were anxious to get information on a proposed parachute kit which incorporated a sleeping bag. Major Sutton kindly supplied this information with photographs on request and thereby rendered good service to the Gore Field group.

Westover Kits: — Major Westover at Edmonton has designed 3 emergency parachute kits. The first, cr #1, was sent to Wright Field with no results. #2 had a sleeping bag incorporated and was also sent to Wright Field, again without results. About 100 of his #3 kits are now being made up at Edmonton from equipment he has been able to assemble by hook or crook from various sources. Much of this equipment, such as the Marble game getter, was obtained with considerable difficulty. This Westover #3 is one of the best yet prepared for Arctic regions. Major Westover has published a small survival booklet "Read and Live" describing the contents and use of this #3 kit. The kit contains the following items: 1 whet stone; 1 410/22 caliber game getter; 1 box 22 long rifle shells; 18 410 shells; 1 hunting knife; fishing tackle; 5 days D ration; 15 cubes beef bouillon; 2 cans coffee; 1 can salt; 2 waterproof match containers; compass; first aid kit; candle; 5 pieces of kindle fire; 1 roll of snare wire; 1 tarpaulin (7x7); 1 signal flag (7x7); 2 pair wool socks; 1 pair mittens; 1 pair of dry tan moccasins; 1 metal cup (square - 1 pt. capacity); 1 mosquito head net; safety pins; tea; 1 knit helmet.

The signal panel is a loosely woven muslin which could also be used as a mosquito bar. The metal cup is made locally in the shops from scrap aluminum. It is square and can be fitted to a handle (included) to be used as a frying pan. Major Westover says the 410 game getter with slug ammunition can kill a caribou at 75 yards. He has put no axe or machete in his kit and says none is needed, though Lt. Todd at Watson thinks such an item is essential, and Lt. Van Nostrand said his folding machete was the best item he had on his survival experience.

Major Westover says "Land and Live in the Arctic" is good, but still only a picture.

Emergency Equipment Carried in Ferried Aircraft: — Every pilot carries his own parachute kit. In addition, the following equipment is put on the planes at Great Falls.

C-47: 1 Sterno stove; 3 cans Sterno heat; 2 flashlights; 8 batteries for flashlights; 1 barracks bag; 1 case K rations, 1 white smoke grenade; 1 red smoke grenade; 1 Gibson Girl radio.

B-25: 1 Sterno stove; 3 cans Sterno heat; 2 flashlights; 8 flashlight batteries; 1 barracks bag; 1 case K rations; 9 M-11 flares; 12 red signal flares; 1 white and 1 red smoke grenade; 1 Gibson Girl radio.

A-20: 1 Sterno stove; 3 cans Sterno heat; 1 flashlight; 4 flashlight batteries; 1 case K rations; 1 barracks bag; 1 red and 1 white smoke grenade; 9 M-11 signal flares; 1 Gibson Girl radio.

B-39: 1 Sterno stove; 3 cans Sterno heat; 1 flashlight; 4 flashlight batteries; 18 units K ration; screwdriver; 4 M-11 signal flares; 1 M-8 flare pistol; 1 red and 1 white smoke grenade; 1 Gibson Girl radio.

No life rafts are carried on any of these planes. My understanding is that all this equipment except the Gibson Girl radio is left in the planes when delivered to the Russians. The radio is issued to the pilots on an M R and they bring it back with them to Great Falls.

Emergency Equipment Carried on Cargo Planes: -- ATC planes flying along the interior route carry several pairs of snow-shoes, a small sled, rations, and considerable other equipment a list of which was not obtained. None of these ships had life rafts though the planes flying along the coast and in the Aleutians had both life rafts and Mae Wests. A troop carrier C-47 ? plane in which I travelled in the Aleutians also had parachutes for about 20 people. The only other time when parachutes were provided was on a Cold Weather Test C-46.

Flight Strips: -- Eight flight strips are scattered along the Alaska Highway between Dawson Creek (#1) and Burwash Landing (#8). Each strip is scheduled to have a shelter cabin and telephone. In February of 19⁴⁴ such facilities were available on some but not all the strips. Personnel will not be stationed at most strips but in one or two cases weather stations have been set up along side the landing area. In other instances, maintenance camps or telephone repeater stations are not far distant on the highway.

Operation of Gibson Girl Radio: -- The proper set-up and use of the Gibson Girl radio is particularly important in winter, as shown by the experiences cited in survival incident #4 following, in which several communications experts could not get the Gibson Girl to operate properly. The Alaska Wing has developed a means of counterpoising the radio on ice or frozen ground where it cannot be grounded. This technique is described in the Operational Memorandum following.

With this method it has been found that the radio can be received for 30 to 50 miles.

THE KEE PIRD FLIGHT

The Kee Pird was due to take off on a routine polar flight at 1030 Alaska Standard Time on the 20th of February 1947. The number four propeller was found to be loose on pre-flight and the take-off was delayed. Lt. Burl Cowan, the navigator, had computed the twilight time and said it was safe to delay it until 1600 if necessary without endangering their safety.

They were airborne at 1420 and leveled off at 12,500 feet, the altitude at which they planned to cruise. When maximum cruise power was established, the Airplane Commander, Lt. Vern H. Arnett, noticed the airspeed was lower than it should have been. Instead of increasing the power setting he decided to let the aircraft settle down to 10,000 feet, thereby saving fuel and keeping the airspeed up. He reasoned that as the plane became lighter from fuel burned, the airspeed would come up to normal. This did not turn out the way he planned, and he was eventually required to increase his power setting slightly. By doing this he could not practice the strict cruise control that is desired on all long polar flights.

Point Barrow was passed at 1800 in twilight and it was over two hours before stars were available for steering or a celestial fix. Weather forced them to climb back to 12,500 feet in order to remain on top of the clouds. A fix was taken at 2125 and gave their position as $81^{\circ}40'N$ $136^{\circ}50'W$, and a correction was made to put them back on course.

At 2335, when a final alteration was made to take them over the pole, the aircraft was moving up along the 60th west meridian. Capella was giving a good course line and indicated they were on the planned track. The last leg to the pole caused some worry to the navigators as the twilight was enough to make celestial sights extremely difficult. It was necessary to use the telescopic sight on their sextants while making observations. At 2400 the pole was crossed and course was set to Alaska. Once this course was established, the celestial navigator took three sights for another fix. These were plotted and the DR navigator disregarded them as the triangle was too large. This fix showed them to be drifting to the left of course but no alteration was made as he didn't believe the fix. Another fix was taken which also indicated the aircraft was drifting to the left of course. At this time an alteration was made and it was the last time they were to have any stars visible for steering or fixing their position.

Just as the plotting of the last fix was finished, the weather began to close around and over them. The last position, determined by celestial, gave their position as $86^{\circ}35'N$ $122^{\circ}00'W$, with the stars obscured by clouds. DR without heading checks was all they had left. No satisfactory precession rate had been established to help in predicting its rate. They were forced to try to climb on top for more sights or at least to see a star that would give them an idea of their heading. When they were finally on top of the weather at 24,000 feet, there was still an overcast of cirrus above them. Then came twilight which ended their chance of determining a position.

At this point the navigators had at least a reasonable chance of coming through to the mainland of Alaska. If the gyro precession rate determined before the twilight was correct, radar winds and ground speeds would keep their DR fairly accurate. There was nothing left to do but hope the precession data was correct and they would cross the coast at some point identifiable by radar.

The ETA for landfall was approximately 0630, but at 0500 the radar operator reported land coming in on the scope. They continued on the same heading until land was crossed and made an effort to identify the terrain. It appeared to be mountainous right up to the shore. This was surprising, as the terrain in Alaska is smooth for more than a hundred miles inland. Around Herschel Island the land is mountainous to within about 40 miles of the Beaufort Sea. This did not fit the picture now on the scope. First they turned left to look over a piece of land that looked familiar, then changed their minds and did a 180 degree turn to follow the coast. This heading was followed for about 45 minutes. By this time the crew was becoming anxious as to their position and wanted to turn inland. This was done, and later they began turns to the right, then left and more 180's until it was impossible to record them at all. The result was that they were just wandering.

With the plane boring around aimlessly and no way to determine direction, every effort was made to make radio contact with someone. The radio operator called Point Barrow and asked for a QDM, and was informed that they did not have the facilities for D/F at their station, then advised the crew that Ladd was the nearest station with this equipment. They had some difficulty in raising Ladd, and when they finally did answer, the operator asked if it was a practice QDM the plane wanted. They were informed that it definitely was not. At that time no operators were on duty and Ladd informed the plane that they would call them when the operators could be located.

The navigator radioed the type terrain they were over and the fact that the sun was just below the horizon. This information was used by the search planners in drawing up the search pattern later that morning. Then, as a last resort, the navigator asked the pilot to fly into the sun. He hoped it would get it up on the horizon enough to obtain a sight. While they were flying toward the sun they were also trying everything possible on the radio. They would get an indication on the radio compass needle and start following it, then the needle would start swinging in all directions. This was tried several times, meanwhile between attempted homings, they continued on toward the sun.

It soon was apparent to the crew that they would eventually have to crash land. Lt. Arnett spotted a hole in the clouds and commenced his letdown so they could visually search for some suitable place for landing. In this area the terrain was quite rough and there still were some heavy broken to overcast skies. They flew around searching for an area, trying at the same time to avoid the heavier clouds. The crew was told to start their preparations for a crash landing. A short time later, through a break in the clouds, open water was seen. This caused additional worry and Lt. Arnett decided to crash land as soon as land was reached and a suitable spot located. Several lakes and smooth spots were looked over; then, while making a turn, the No. 2 engine cut out. Darkness was closing in and fuel getting low; time was now limited. They had to get down without further delay.

While cruising in the vicinity of a large glacier, Lt. Arnett chose a lake that he had seen earlier as the landing spot for the Kee Bird. The crew was alerted for landing, the navigators wrapped the sextant in heavy flying clothes and stowed it in a quickly accessible place, and all the crewmen took crash landing positions. Lt. Arnett made a normal traffic pattern and approached with full flaps down and the landing gear retracted. At the command of the pilot the flight engineer, Lt. Luedke, cut the switches and Lt. Cowan, sitting beside him, pushed the mixture controls into idle cut-off. The tail skid struck first and dragged for about 25 feet, then a clear spot for about 50 feet before the fuselage came to rest. The plane skidded for about 800 feet and stopped. The only sensation was the deceleration. The plane did not turn from its initial heading once it struck the ice.

When they stopped sliding, Lt. Jordan, the co-pilot, climbed through his escape hatch with a fire extinguisher to combat any fires that might start. The number three engine was smoking, but later they decided it was caused by snow

in the exhaust. The crew abandoned the plane with all possible speed, but not before throwing out all emergency equipment. At this point good luck began replacing their bad luck.

After landing, Lt. Arnett discovered the reason for the slow indicated air speed they had had on the trip. The tail skid did not retract with the main gear on take-off.

They immediately started organizing the camp. Lt. Arnett was suffering from a severe cold and sore throat and Lt. Jordan took over part of his duties as commander of the crew. Oil was drained from the No. 1 and 4 engines, emergency equipment was stored, rules of sanitation made, and with this was a general discussion of where they were. It was almost three hours until darkness would set in and the navigators would be able to shoot a fix.

As soon as it was dark, Lts. Lesman and Cowan began taking sights. This was extremely difficult due to the cold. Cowan plotted one shot and found that it came through Borden Island. He gave this position to Sergeant Leader, the radio operator, for transmission. Cowan left the front to assist Sergeant Yarbrough in starting the APU unit in the rear of the plane. Lesman continued to work on the sights. He found they had maps for the planned route only; no emergency maps were aboard. Lesman had to change the meridian values on the World Aeronautical Charts before plotting. By trial and error he obtained a fairly reasonable idea of his position from the first sights. He then took another set of three and plotted his position as $80^{\circ}10'N$ $60^{\circ}00'W$. This later proved to be within five miles of their actual position. Considering the difficult circumstances in which these sights were taken and plotted, Lesman is to be commended for his fine work.

Sgt. Yarbrough, with assistance from different crew members, was finally successful in starting the APU unit. The temperature was so low that the starter would not turn the engine. They managed to wind a rope around the fly-wheel and pull to assist the starter. The first try they discovered the rope was wound backwards from the direction the engine had to turn. Some of the Kee Bird crew's most anxious moments were centered around this. It could easily mean the difference between early rescue and long exposure or even death. Their hands were almost frozen trying to wind the rope around the flywheel for try after try with no results. After about two hours of "sweating it out" they succeeded in getting it started. This meant that as long as they had fuel, they had a chance of making contact with the outside, as this unit furnished power for the radio. After it was once started, they

never let it remain idle for more than 30 minutes.

During this time, Ladd Field was huming with activity. Search plans were being drawn to cover the entire polar area. A B-29, piloted by Captain Richmond McIntyre, had left Ladd to search when word came they were on Borden Island. Captain McIntyre immediately set course for Borden and was later in contact with the crew of the Kee Bird when they reported having fixed their position in northwest Greenland. He immediately set course for the coordinates radioed by Sgt. Leader. The "Gibson Girl" had been set up and put into operation for the rescue planes to "home" on. They checked it by listening to it on the Kee Bird's radio. Later it was found that search planes could not receive it however.

Captain McIntyre's plane was in voice contact with the downed crew but his fuel supply was running low and he was forced to return to Ladd Field before sighting them. He gave them encouragement, and informed the crew that another plane had left Ladd and would arrive early the next morning. He described briefly the activity at Ladd to let them know that all possible was being done to effect an early rescue.

Though Captain McIntyre gave all the encouragement and hope possible, his failure to locate them was disappointing. That night was the longest night the Kee Bird crew had ever spent. They had difficulty in getting comfortable places to sleep, and in trying to keep warm. The natural anxiety of being located soon ran through their minds; their lack of indoctrination on surviving under these circumstances made it difficult, as they could only learn through trial and error. Their common sense and sound thinking was proven, as they survived three days without a single casualty from frost bite.

They were up and stirring early the next morning. It felt good to be up and moving; blood began circulating and knots and kinks in their muscles from the uncomfortable night began to loosen. Captain McIntyre's promise was carried out on time. Another B-29 piloted by Captain Donald Allenby called the crew when they arrived in the vicinity. They were attempting to pick up the Gibson Girl to home, while the rest of the crew was scanning every inch of the terrain for any sign of the downed plane. All attempts to pick up the Gibson Girl were unsuccessful. Sgt. Leader, while talking with Captain Allenby as he cruised around searching, was able to guide them by "build up" and "fade out" on his radio. It was through this method that Captain Allenby located them visually and dropped supplies.

After Captain Allenby left the scene to return to Ladd Field, they busied themselves carrying in the supplies that he had dropped. Sgt. Yarbrough took a can that was dropped and filled it about half full of gasoline, then submerged a parachute harness for a wick and set fire to it. This gave off plenty of heat and lasted for about five hours. That night the fire guards were selected and the crew retired in much better spirits. They killed one another and told jokes. They felt now that their chances were good.

The next day three of the crew went out to do some hunting. Others were looking over the lake to mark out a possible landing strip. The hunters returned without any kills but reported seeing tracks of several types. Their stories of the hunt were entertaining to the rest of the crew.

Ladd Field contacted Lt. Arnett and asked his advice on landing a P-17 on the lake to pick them up. Arnett discouraged this as previous experience with this type of plane convinced him that the loose snow on the lake might cause it to nose up on landing.

Thule, Greenland advised them that a C-54 with Jato was enroute from Westover Field, Mass to investigate possibilities of rescue. They made an appointment to have Arnett talk with Lt. Cavnar at Thule and advise him if a landing with a C-54 would be advisable. Arnett was confident it could be done safely and told him that they would mark out a runway.

That night the crew settled in their sleeping bags for a good night's sleep. Not only were their minds more at ease because rescue was near at hand, but experience had taught them how to prepare for sleep. Lt. Lesman said on his first night he slept in the fuselage with all his heavy clothes on and was cold and uncomfortable all night. The second night he slept out in the open with most of his clothes on. This was some better but still not cozy. Some of the crew stripped down to their under-wear and they said this was much better in both warmth and comfort. Lesman said he couldn't see stripping in the 40 below zero air.

The crew was out early the following morning. Contact had been made with Thule again and they were advised that Cavnar had taken off and were given his estimated time of arrival. All eyes were on the horizon, each hoping to see him first. Finally he was spotted on an east heading going past without seeing them. Sergeant Leader gave Cavnar a call by radio and directed the plane to their lake. Arnett talked again with Cavnar and told him that the runway was marked off

by the crewmen and gave him the heading on which to approach. The C-54 circled and finally made a low pass at the field and went around. The next time he was supposed to touch his wheels, then give her the gun and go around once more. Arnett was going to inform the transport if his approach and touch-down looked OK and recommend whether or not a landing be attempted. This, however, is not the way Cavnar carried it out. He made his approach, touched his wheels and completed the landing on this approach instead of the next as planned. The plane overshot and ran into soft snow and rougher terrain. As there was no damage done, this area was determined as suitable for runway if needed on take-off.

After landing, the transport taxied up and down the runway several times to pack the loose snow. During this period the crew gathered back at the Kee Bird and waited to load. They finally taxied in and attached the Jato units to the C-54, threw out all surplus emergency equipment, made movies of the crew and finally loaded the Kee Bird's crew.

During this loading period another B-29 from Ladd Field, piloted by Captain Jack Setterich, was circling the downed plane. At Lt. Cavnar's request, since the C-54 had unloaded all its emergency equipment to lighten the plane, the B-29 was asked to act as escort back to Thule. Captain Setterich readily agreed as he had enough fuel to do this and still return to Ladd.

When the crew was loaded, they taxied out for the take-off. When the airspeed reached approximately 50 miles an hour, the Jato units were set off and the plane jummed into the air with runway to spare. Captain Setterich did not leave the rescue plane until it was on final approach at Thule, then set course for home.

In a few days the Kee Bird crew was back with their unit ready for work. This flight did more than just cost the Air Force an airplane and expense for the rescue operation. Other crewmen that were making the same flights daily learned that they were not expendable, and that there was a chance of rescue if forced down in the polar regions. The Kee Bird's crew was back to tell whether or not the emergency equipment carried aboard the planes was adequate or not. They knew what it was like to be down within the shadow of the pole and survive. The information they passed on to their fellow crewmen was invaluable to morale and confidence.

6.00 SURVIVAL UNDER ARCTIC WINTER CONDITIONS

6.01 GENERAL REVIEW OF THE PROBLEM

167 As has been pointed out in Vol I of this report, the only serious obstacle to the actual flying of existing aircraft safely under arctic winter conditions at the present time, is the provision of adequate probability of survival of the aircrew in the event that they are forced down. Once the aircraft becomes airborne, arctic operating problems almost cease to exist, unless the aircraft fails to return to an established base. At present under that circumstance little likelihood of survival of personnel can be expected, unless they are located immediately.

168 The problem, although serious at the present time, may be attacked in two ways and both should be initiated immediately in order that operational risks should not get further out of line with the technical development of aircraft. These methods are:

- (a) Immediate provision of the best available emergency equipment, rations, clothing, and training facilities for all personnel required to fly over the north.
- (b) Institution of a co-ordinated development program to deal with the existing unanswered questions regarding arctic survival.

169 Winter Experimental Establishment has been actively concerned with this problem for some time and, although little progress has been reported to date, numerous apparently unrelated small steps have been made toward the general solution. It is therefore considered advisable to review here the problem, as it is seen by WEE, to report what progress has been made to date and to indicate what further steps should be taken.

170 Survival in the Arctic depends on all four of the following conditions:

- (a) The safe arrival on the ground of the personnel and survival equipment and clothing, whether by parachute or by forced landing.
- (b) The type and amount of emergency equipment available after arrival on the ground.

- (c) The clothing the personnel are wearing.
- (d) The training the personnel have had.

Safe Arrival on the Ground

171 As there is small chance in peace time of aircrew or passengers being forced to abandon an aircraft in flight it is suggested that immediate action should provide only for the case of a successful forced landing. WEE does not consider that it will be impossible to protect personnel who are forced to parachute to "safety" in the Arctic, but it does consider that this problem is so much more difficult that it will require at least two years further development before a satisfactory solution will be found. Further, as this problem is not likely to arise in the immediate future, it is recommended that, for the present, if attention be focussed on protecting the forced-landed crew, it should be possible to achieve a practical worth-while measure of success in the current year.

Emergency Equipment

172 At the present time there is no available emergency equipment which has been developed to meet the conflicting RCAF requirements of light weight with minimum bulk and adequate protection on the ground under arctic winter conditions--in fact no one has been able to lay down the minimum requirements to ensure adequate protection on the ground. One thing is certain, however, the existing scale of issue in the RCAF is inadequate, nevertheless, from studies made at Churchill, it is possible to stipulate a scale of equipment which will provide adequate protection for personnel. Because it was not developed to fulfill airborne requirements, its weight and bulk are excessive, but not prohibitive in peace time, and it is recommended that a revised scale of issue utilizing this existing equipment, be drawn up immediately and that all aircraft operating over the north be fitted with this prior to the 1948-49 season.

173 Simultaneously a co-ordinated development program should be instituted to determine the minimum survival requirements and to provide the minimum weight and bulk of equipment to meet these requirements. This will be a particularly difficult study requiring the full attention of a medical officer, a person experienced in the north, an experienced aircrew officer, an engineer, and a conscientious test team as well as the advice of experts on various materials.

174 The problem of Arctic winter clothing has received considerable study during the past two winter seasons. The existing RCAF scale of issue is completely inadequate, but again it is possible to combine existing items of clothing, chiefly by adopting equipment from the Canadian Army as noted in the recommendations of this Vol, to outfit a man well enough to enable him to survive under arctic winter conditions. Nevertheless, this revised temporary scale of issue should be drawn up immediately and provided for the 1948-49 winter season. Otherwise, in the event of a forced landing lives may be sacrificed needlessly.

175 Again it is recommended that a study of RCAF clothing requirements be made and clothing be developed and produced to meet the exacting demands of suitability for use in the air and for survival on the ground under arctic winter conditions. This study should be conducted in conjunction with the emergency equipment research discussed in para 173.

Training

176 Training for survival in the Arctic is of greater importance than survival training under most other circumstances. There is a great deal which the man must do in order to survive, and there is a great deal more he can do to make his lot easier. However, notwithstanding the fact that suitable equipment and clothing have been provided, it is very easy to make one mistake which will spell disaster under the critical circumstances for which we must provide. It is recommended therefore, that a school of RCAF arctic survival, using only the equipment and clothing which may constitute the scale of issue current in the RCAF at the time, should be conducted in the Churchill area to teach and give practice in survival techniques. It is to be noted that suitable weather conditions for such a school exist only three or four months a year and the aim should be to train as rapidly as possible at least 50% of all personnel, including passengers, who are required to fly north.

6.02 PROGRESS IN ARCTIC SURVIVAL AND FURTHER RECOMMENDATIONS

177 Numerous phases of the problem have been given considerable thought at WEE during the past few years, but not as much progress as desirable has been possible because of limitations on equipment available, lack of trained observers and insufficient liaison with other organizations engaged on similar work. During the current winter season some opportunities were afforded WEE of co-operating with the Canadian Army at Churchill, the IAM, Toronto, and the IAM, Farnborough.

Clothing from various sources was provided for comparative tests but samples of all available types of clothing and equipment should be provided before the test season commences in order that properly planned and conducted test programs will ensure correct findings.

Safe Arrival on the Ground

178 This unit has nothing to add to the existing information concerning the flight technique of executing forced landings in the Arctic. The chief concern of WEE at the present time is the problem of survival after a successful descent has been made.

179 The problem of parachuting, however, has been studied and an emergency seat and back packs (Sec 3.05 Fig 20 and Sec 3.06 Fig 21) have been made at WEE. Both of these were intended for use in fighters but neither carries sufficient equipment at the present time. It is improbable that the required equipment will be reducible to a size that will pack into one of these containers and provision will have to be made in the design of the aircraft seats to accommodate a container of larger size. It is recommended that allowance for this provision be made in the design of aircraft intended for use in the north. The alternative to this, and probably a necessity for personnel parachuting from heavy aircraft, is the provision somewhere in the aircraft structure, of one or more parachutable containers which would be released in the centre of the "stick" of men.

Emergency Equipment

180 It is considered at WEE that arctic emergency kits should contain a tent, sleeping bags, snow knives, firearms and ammunition, some means of heating food, extra clothing, medical supplies, rations and other minor items. Tests at WEE and elsewhere have proven the inadequacy of the rations, the sleeping bags and other items as discussed earlier in this volume.

181 Cooking, on survival exercises, was done in a pressure cooker and the resultant saving in fuel makes this item worthwhile. A cooker designed to match the ration container would be an asset.

182 The pocket Coleman stove was the smallest stove obtainable which would burn all types of fuel. This stove was found adequate when used in conjunction with a pressure cooker.

183 A toboggan would be a desirable item of emergency

equipment, as it would enable a crew forced down to gather fuel or transport injured personnel to shelter. WEE developed a toboggan kit which is a combination of an aircraft basic kit and a toboggan. Once on the ground this kit can be unfolded and by a very simple operation be converted into a five foot toboggan.

184 Very thorough durability tests were given this toboggan at Churchill and it was found to be as good as, and more substantial than an ordinary toboggan. Details of this kit are found in Sec 3.08.

185 In order to utilize the prevalent winds above the tree line and to obviate disaster in the event of the aircraft burning with loss of all fuel, it was proposed at WEE to experiment with a wind charger and an electrically heated thermally insulated pressure cooker. Unfortunately no work could be done on this project during the current test season, but it is considered worthy of considerable study and development.

Clothing and Aircraft Temperatures

186 Detailed tests on all available types of clothing were carried out and are reported upon earlier in this volume. One general conclusion evident from the tests was that clothing, to be adequate for survival, must fit properly. This immediately eliminated the possibility of providing complete survival clothing in the aircraft emergency kits. It is evident, then, that each individual must carry his own survival clothing aboard.

187 Casual observation of aircraft crews and passengers travelling the North West Staging Route or the routes to Churchill, indicated how far this was from current practice. The passengers were not provided with the clothing and the crews frequently did not care to carry their's because the crew compartment was warm and they did not plan on staying at any cold place. In the event of a forced landing of any of these aircraft under average arctic winter conditions, the probability of survival of any of the occupants would be so small as to not warrant the expense of a search. Some means of ensuring that all personnel have adequate clothing on board is, therefore, necessary. Under operational conditions, it will also be essential that all personnel be fully dressed, capable of leaving the aircraft at any instant.

* * * *

195 Indications at the present time are that, if crews

and passengers are dressed in a manner suitable for survival under arctic winter conditions, a comfortable and efficient operation is possible in aircraft in which the temperature is thermostatically controlled at a steady value between -10°C and 0°C. This requires considerable improvement in aircrow clothing and local heating of the navigator's and wireless operator's tables. In the case of certain aircraft it involves little more than the recognition of existing cabin temperature levels as adequate rather than grossly deficient; and in all cases it ensures that personnel will be adequately clothed for survival under arctic winter conditions.

Training

196 WEE has strongly advocated arctic survival training for some time. During the current test season, several personnel were trained in the Edmonton area on a one week bush survival course, which was conducted by 6 Communication Flight, Edmonton. This type of course is an excellent initial survival training course, but might be more advantageously conducted in the bush in the Churchill area, where more rigorous climatic conditions are encountered.

197 Survival exercises, primarily to test the adequacy of equipment and clothing, were conducted by WEE at Churchill. It was evident to personnel who took part in these exercises and who have been actively engaged on survival equipment testing for two years, that their training was inadequate. This points to a woeful deficiency in arctic winter survival training among RCAF aircrows, as it is considered that WEE personnel were even more familiar with the problem than the average of those flying over the north at the present time.

198 An opportunity was afforded WEE of training two officers on the Canadian Arctic Instructor's Course. These officers were compelled by their other duties on the unit to cease training before the completion of the course. However, the value of such training was evident, although it is considered that survival training should be conducted by the RCAF and be designed to use RCAF survival equipment, rations and clothing.

General Conclusions

199 In conclusion it cannot be over emphasized that, unless the service is willing to bear the moral responsibility for unnecessary loss of life, immediate action must be taken to:

- (a) Supply all personnel flying over the arctic regions in winter with the best of the clothing and equipment now available, and
- (b) take the necessary steps to organize an Arctic Survival School in the Churchill area. This school should be ready to accept its first course for training on approximately 1 Dec 48.

PART TWO - SURVIVAL INSTRUCTIONS

ALASKAN WING
AIR TRANSPORT COMMAND
U.S.A.A.F.

W H A T T O D O

IMPORTANT

PASSENGERS TRAVELING ON ATC PLANES OF THE ALASKAN WING WILL READ, FAMILIARIZE THEMSELVES, AND BE HELD RESPONSIBLE FOR COMPLIANCE WITH THE RULES AND REGULATIONS SET FORTH BELOW:

1. In connection with your travel via Air Transport Command operated aircraft, certain things will be expected of you that will contribute to a safe and pleasant passage for both yourself and your fellow passengers. Most of these requirements have their basis in Army Flying Safety Regulations; others are based on Army Regulations dealing with security and international law.
2. PILOT IN COMMAND: The pilot of an Army Aircraft is in command control, exercising complete jurisdiction over all matters pertaining to safety and security. His decisions are final while the plane is on the ground, in flight, or in the event of a forced landing. Certain flights will have as a member of the regular crew complement a Flight Traffic Clerk. Flight Traffic Clerks are representatives of the authority of the pilot in maintaining cabin discipline and compliance with flying safety and security regulations.
 - a. SAFETY BELTS: Passengers will immediately be seated and fasten safety belts. Passengers will remain seated, with safety belts fastened, during taxiing and takeoff and for at least five minutes thereafter. Passengers will be seated and fasten safety belts at least five minutes prior to landing and keep them fastened until aircraft has come to a complete stop. Seat belts will also be worn during turbulent weather or upon instructions from a member of the crew.
 - b. PASSENGER MOVEMENT ABOARD AIRCRAFT DURING THE FLIGHT: An aircraft is loaded to permit level flight and maintain best gliding angle in event of loss of an engine. Passengers moving from their seats to the rear tend to destroy this balance, setting up dangerous flight conditions. Passengers are therefore requested to avoid congregating in one location or going to the tail of the aircraft when someone else is there.

Passengers will not open emergency exists, hatches, or doors opening to the outside during flight unless directed by the pilot or a crew member.

c. SMOKING RULES: Smoking, striking matches, or the use of any device producing flame, is prohibited within 70 feet of any aircraft while on the ground. Smoking is prohibited aboard certain type aircraft at all times, and on other types is permitted only under certain conditions and in specific compartments. For this reason, smoking will be permitted only when authorized by the pilot or his representatives. This rule is to be strictly adhered to as it is for your safety. In many instances, gasoline tanks are carried in the cabin and may give off fumes which are highly inflammable and explosive.

d. FOREST FIRES: There has been an increased number of forest fires between Edmonton and Fairbanks and along the Canol Route which have been traced to determine their origin. Since the majority of these fires have started along radio range legs and flight lines of aircraft, it is reasonable to assume that many of these fires can be attributed to the practice of dropping lighted cigars and cigarettes from aircraft. The Canadian Department of Lands and Mines has spent a great deal of time and money in combating these fires, which often occur in inaccessible terrain, thereby increasing their danger. This Headquarters has been asked to bring these facts to the attention of pilots, passengers, and others concerned with the movement of aircraft over the route. Each pilot is responsible for the conduct of personnel either as a passenger or crew member riding aboard his aircraft, and is reminded that it is unlawful at any time to drop objects from an aircraft in flight, except in emergency conditions, or should the occasion so dictate on a tactical mission.

e. DISTURBANCE OF CARGO: Passengers are forbidden to disturb any cargo or baggage (even their own) when stowed and tied down in the aircraft. Any shifting or loosening of tied down cargo may endanger the entire aircraft. Under no conditions may any cargo or mail be tampered with. Failure to observe this rule subjects the offender to disciplinary action.

f. USE OF CAMERAS: Passengers will not be permitted to use cameras aboard Air Transport Command aircraft without special permission from authorized Air Transport Command or Theater Headquarters. Cameras may be transported providing they do not contain film and further, that they are carried within baggage and not removed therefrom during flight.

g. MISUSE OF EMERGENCY SURVIVAL EQUIPMENT: Emergency

equipment, including life rafts, life belts, and kits are carried solely to assist in survival in the event of emergency conditions. Damaged or mislaid survival equipment may cost lives. Passengers are prohibited from utilizing such equipment for "comfort" purposes or under any other condition other than emergency.

h. PRISONERS OF WAR: No passenger, civilian or military, will be allowed at any time to converse or communicate in any way with Prisoners of War or Civilian Enemy Internees being transported on the plane. Any necessary communication must be done through the accompanying armed guard.

i. CREW COMPARTMENT: Passengers will not enter the Crew Compartment except on specific invitation by the Pilot, nor are they allowed to interrupt or interfere with members of the crew in the performance of their duties.

j. FLIGHT TRAFFIC CLERKS: The Flight Traffic Clerk in addition to other duties, is assigned as a crew member to administer to passenger comfort, maintain cabin discipline to assure a pleasant trip. Please assist him in keeping a clean and orderly cabin.

k. PERSONAL EFFECTS CARRIED ABOARD BY PASSENGERS: Before you deplane, either at change points enroute, or upon arrival at destination, make sure that your baggage and personal effects are removed from the aircraft.

l. SAFEGUARDING MILITARY INFORMATION: All personnel are reminded that information pertaining to the operation of the Alaskan Route, particularly with respect to our installations, equipment, plans and movement of aircraft, is of vital military value and will not be discussed. Civilian personnel are under the same responsibility as military personnel to guard information that may be of value to the enemy. We are all fighting this war together. It may seem smart to tell others what you know, but it is smarter to keep your mouth shut--and tell others to do the same.

m. LAVATORY AND AIRSICKNESS: There is a lavatory on board for your comfort. The Flight Traffic Clerk will show you its location. In case of airsickness, accompanied by nausea, there are facilities in the ship for your use.

n. The use of intoxicants or drugs during flight is prohibited.

FORCED LANDINGS

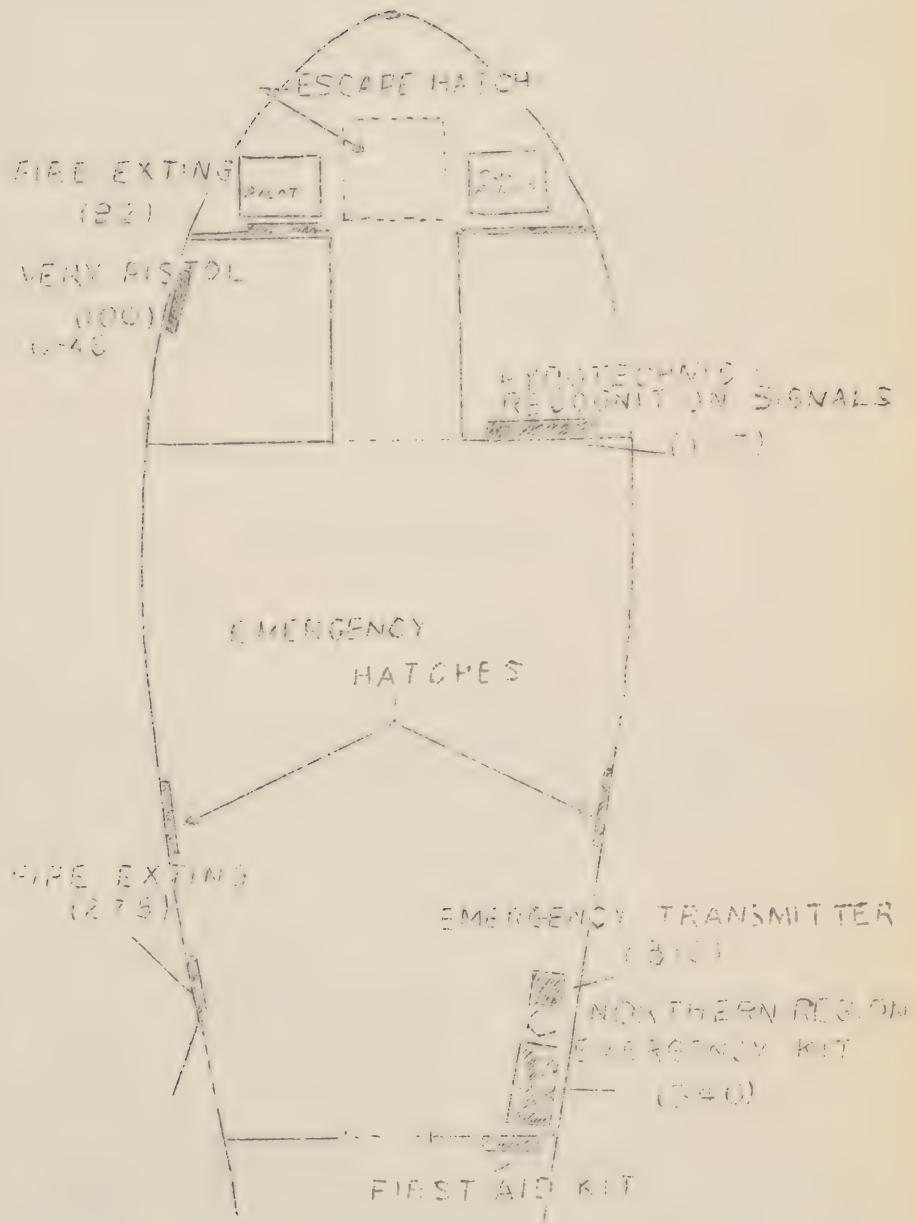
REMEMBER that forced landings are rare occurrences. The Alaskan Wing has a trained, fully equipped Search and Rescue Squadron ready at all times for any such accident.

In case of emergency, if the pilot decides to make a forced landing, he will notify you. Brace yourself as much as possible. After the shock of landing, leave the airplane immediately. It may catch on fire. Take as much of the emergency equipment as possible with you. Help passengers who may be injured. If the airplane does not burn, go back and start making camp. Take care of the passengers who may be injured. Get out the Red Cross first aid manual and study it before attempting first aid. Make your camp and start preparations for signalling for help.

S T A Y with the plane

After the landing make your camp. Build your camp as close to the airplane as possible. Pick a sheltered place out of the wind where there is plenty of wood to keep your fire going. Use the tent for a shelter. Cut small spruce boughs to put on the ground for a bed to keep the sleeping bag from freezing to the ground; in warm weather, to keep the sleeping bag off the damp ground. Lace one end of your shelter shut. Build your fire a few feet from the open end of your shelter. Be careful not to burn your shelter or your sleeping bag. Bank snow around the bottom of your shelter. Keep the shelter as near air-tight as possible. Rocks may be heated in the fire and put in the shelter. Large rocks heated in the fire, then put inside the shelter with the shelter closed up tight, will keep you warm for some time. See that both ends of the shelter are closed up tight before going to sleep. The body heat will help to keep a small shelter warm. Keep your sleeping bag dry. Do not sleep in wet clothes or in a wet sleeping bag. Dry them out before going to sleep.

EMERGENCY EQUIPMENT LOCATED
IN YOUR AIRPLANE



LET US KNOW WHERE
YOU ARE

If in open country, make a signal flag and spread it on the ground so it can be seen from the air. If in timber country, cut a long slim pole, something not too heavy, and tie the flag to the small end, then climb the tallest tree and pull up the pole with the flag on it, using the shroud lines from your parachute to pull the pole up with. Then tie the pole to the top of the tree so that the flag will wave out above the top of the other timber. Keep the snow brushed clean from your airolane. It can be seen much better from the air. Remember, do not lose your camp. Be sure you know how to get back to it. Use your compass and get your directions straight. Keep your watch wound so you can keep the time of day.

DRY 'EM OUT

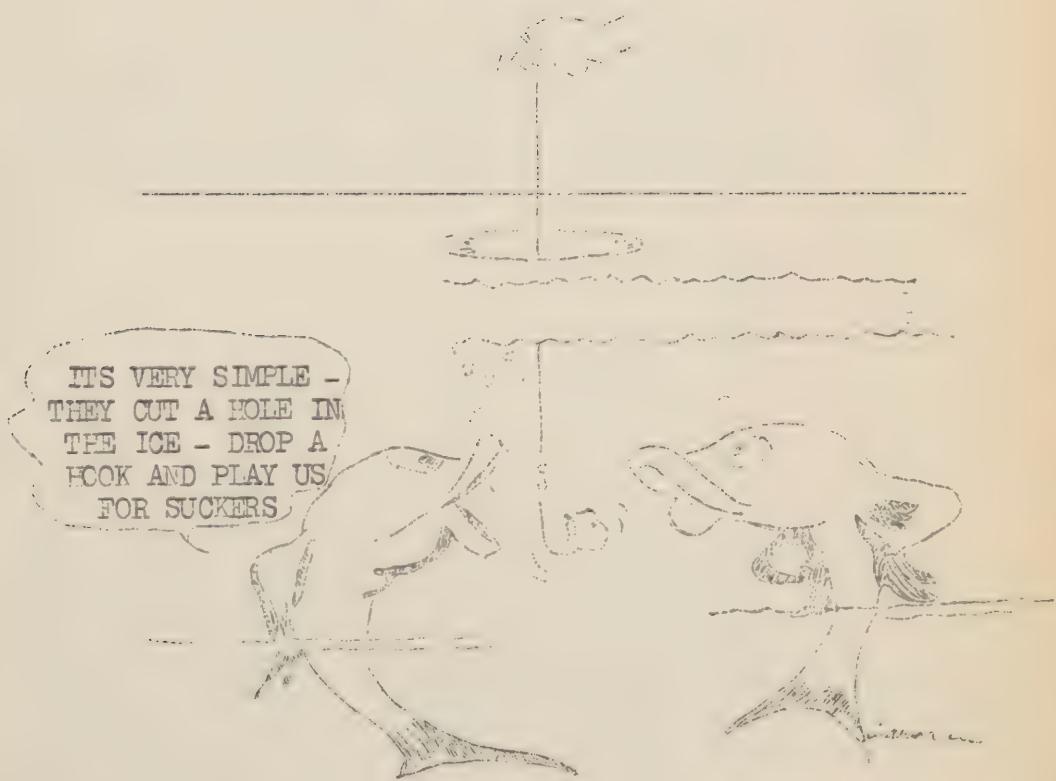
If your feet get wet, take off your wet boots and socks. Put on a new pair of dry woolen socks and shoes or moccasins. Keep your feet dry at all times. Dry out your wet socks and boots immediately because you may get wet feet again.

KEEP YOUR HEAD!

Do not get excited, for your rescue depends a lot on you. When you leave your camp for any reason, make sure you can find it again. Use your compass to get your directions straight and be sure that you can come back to camp.

C A T C H 'E M

Fishing tackle is provided in the kit. Fish may be caught through the ice during the winter or in some lakes and streams in warm weather. When cooking fish over an open fire, dress the fish out, rub a little salt inside the fish, and roast over a slow fire.



KEEP THE FIRE BURNING AT ALL TIMES

A handful of birch bark will start a fire. Then add some small dead spruce or pine boughs. After once starting a fire, try to keep a small fire burning at all times. Gather enough heavy pieces of wood during daylight to keep a fire going all night. Keep an ample supply of dry wood and green branches handy to the fire, so that they can be put on the fire if you hear an airplane approaching. Green spruce boughs burn well and produce dense smoke if a good fire is going. Smoke is one of your best signals.

S H O O T ' E M

Conserve your rations and do not waste your ammunition. Shoot just what you need to eat. Ducks, rabbits, squirrels, or any kind of birds are good to eat. Skin the bird or animal and dress them out. Rub on a little salt and roast over a slow fire. They can also be cut in small pieces and stewed in the sauce pan with a little salt or a beef cube.

C A R E F U L

If you are not sure that your water supply is good in warm weather it is well to boil your water before drinking. If in winter, snow may be melted for water, but be careful in melting snow not to burn your pan before the snow starts to melt. Put just a little snow in the pan first until a small quantity of water is in the bottom of the pan before adding more snow. Beef cubes are provided in the kit. One beef cube to a cup of hot water makes a good bouillon. Do not waste your food or matches.

S N A R E 'E M

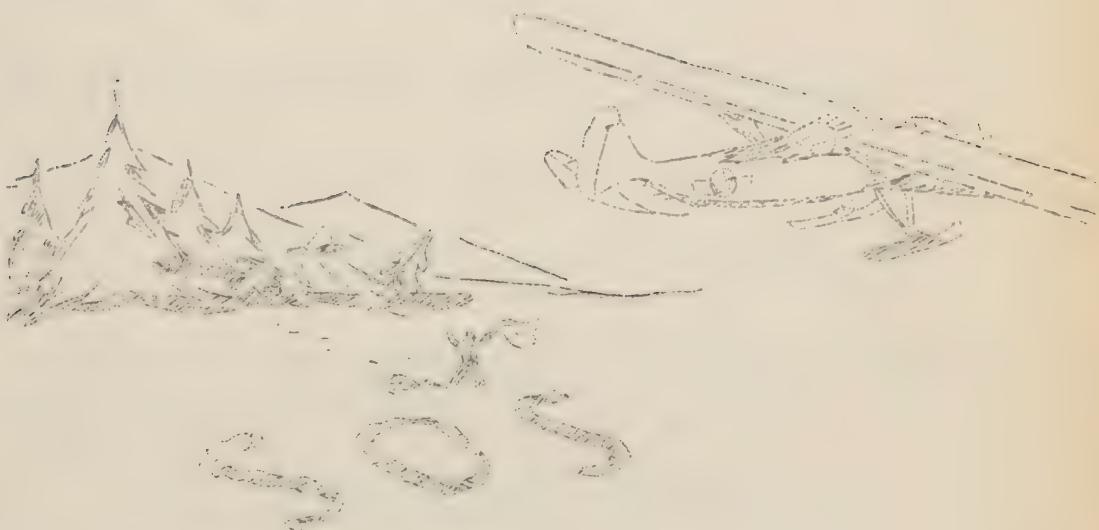
A roll of fine wire is provided in the kit. It can be used for snare wire for catching rabbits or small game. Find a rabbit path or trail where they go through between two small trees or under a log and set a snare there. Go to the snares early in the morning. Set out two or three of such snares.



S I G N A L S

Smoke is your best signal. If you are near or on a lake that is frozen hard enough to support your weight, make a large SOS in the snow and outline it with spruce boughs. Signal by radio -- if your radio works, call on the hour but don't use your battery up all at one time. Save your battery as much as possible. Signal by light -- if you have a flashlight and you hear an airplane approaching, point the flashlight at the airplane and give him the SOS ...---...; wait a few seconds and repeat, but do not wait until the airplane has passed. Do this while the airplane is coming toward you. Use the "Gibson Girl" radio (see directions).

WHERE I AM //



R E M E M B E R

1. If you are forced to make an emergency landing, stay with your ship if possible. Conserve and make best possible use of all equipment and food.
2. You must realize that your life is in your own hands. Remember a search is being made for you, so let your location be known by any possible means.
3. It is very easy to become lost. Use extreme caution while hunting. Follow your trail back to camp; don't take short cuts.
4. Try to shoot some rabbits or other game or fish to use along with your rations. Do not wait until your rations are gone.
5. Conserve your food and equipment. Use it to get the most from it. If you smoke, light your cigarette from your camp fire and save your matches.
6. You have a Gibson Girl radio set; study the instructions and set it up. Operate for ten minutes starting on the hour, every hour.
7. If you have not been found after five days and you decide to leave your wrecked plane, take your Gibson Girl and walk down hill to the first stream.
8. Walk down stream until you come to a larger stream or river. Continue walking downstream until you find a trapper's cabin.
9. Do not travel at night. Make your camp and set up your emergency radio.
10. When you hear an airplane, get out in the open and use your signal flag. It can be seen from quite a distance.
11. After five days, searching parties will be looking for you along the rivers and streams. A lot depends on you. Help us find you, and we will help you to get out.

REMEMBER, THE ARCTIC SEARCH AND
RESCUE SQUADRON WILL BE SEARCHING FOR YOU

INSTRUCTIONS FOR "GIBSON GIRL" RADIO ON
FOLLOWING PAGES

OPERATION OF THE "GIBSON GIRL" RADIO

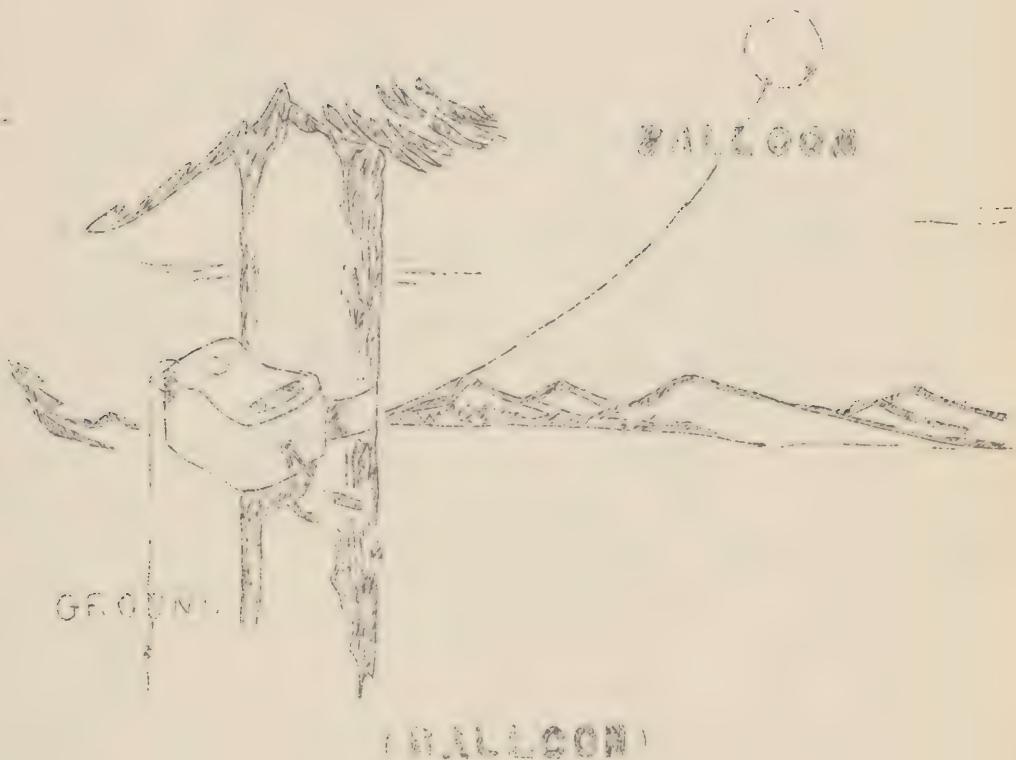
not this



but this



Install radio on tree, face up as shown
above, then install crank.



To operate in this manner, inflate balloon as directed and attach antenna before sending aloft. Antenna lead must then be attached to antenna.

NOTE: To ground set, extend extra roll of antenna wire along surface of ground in opposite direction from that used by antenna, and fasten "ground" lead to this wire.

This method will transmit within a radius of approximately seventy-five (75) miles.



(COUNTER-POISE METHOD)

Extend antenna between two trees, or if there are no trees available, along the surface of the ground, and attach the antenna lead to same.

NOTE: To ground set, extend extra roll of antenna wire along surface of ground in opposite direction from that used by antenna, and fasten "ground" lead to this wire.

This method will transmit within a radius of approximately twenty-five (25) miles.

1. After installing radio in one of three foregoing methods, set center control "radio" switch to one of three positions, and while cranking, turn "TUNE" control knob until light marked "tune to brightest" is at brightest point. (NOTE: If center control "RADIO" switch is on manual, key will have to be pressed before tuning light will operate.)
2. Auto 1 sends out automatic S.O.S.
3. Auto 2 sends out automatic A.A. DO NOT USE.
4. Center control "RADIO" switch must be on "MANUAL" when operating key. (NOTE: Crank must be revolved at all times to operate set.)
5. To use signal light, center control "LIGHT" switch must be on one of three positions.
6. READ THOROUGHLY THE DIRECTIONS PRINTED ON THE TRANSMITTER.

FIRST AID

GENERAL First Aid measures consist of (1) sustaining respiration, (2) stopping hemorrhage, (3) relieving pain, and (4) preventing or treating shock. They can usually be accomplished simultaneously.

RESPIRATION is sustained by continuous artificial respiration.

HEMORRHAGE is stopped by covering wound with a sterile bandage and applying steady pressure, or using a tourniquet between wound and heart.

SHOCK is treated or prevented by keeping patient warm, lowering head and elevating body while body is supine, stopping hemorrhage and relieving pain. Shock is manifested by cold damp skin, weakness and rapid weak pulse.

LOCAL FIRST AID MEASURES

First Aid measures will be carried out generally after general measures have been accomplished.

W O U N D S

1. If very dirty, clean wound with soap and water.
2. Shake sulfanilamide powder evenly into wound.
3. Cover wound with sterile bandage.
4. Do not use antiseptics on wounds. (They coagulate tissue and generally do harm.)
5. Take sulfadiazine tablets as directions on package specify.

FRACTURES

1. Use long splints and pad them well.
2. Fasten splints securely to limb. (Idea is to prevent all motion at point of fracture.)
3. Watch circulation in limb when weather is cold.

BURNS

1. Apply sulfadiazine or boric ointment.
2. Cover with sterile dressing.
3. Watch for evidence of shock.

FROSTBITE "Watch for It and Prevent It Early"

1. Do not rub with snow or massage the skin.
2. Warm frostbitten area slowly. (Severe pain shows that thawing is too rapid.)
3. Further treatment is same as for burns.

SNOWBLINDNESS

This is not blindness but intense pain in eyeballs due to glare as a result of looking at snow without protecting the eyes. Sometimes it occurs very quickly. Prevent by using colored glasses or goggles constantly. Emergency goggles can be made by punching small holes or T slits in bark or canvas.

Treat by rest and darkness -- may last as long as ten days.

I N S E C T B I T E S

Best treated by ammonia water or baking soda. Do not scratch them - rub them.

C A R B O N M O N O X I D E P O I S O N I N G

This may occur where combustion type heaters are used in close spaces, where exhausts leak, or where hydraulic fluid falls on hot engine surfaces.

Get patient into fresh air immediately -- give artificial respiration if necessary and keep him quiet.

REMEMBER -- DO NOTHING THAT WILL HARM PATIENT AND GET HIM TO A DOCTOR AS SOON AS POSSIBLE.

F I R S T A I D K I T S

These are available in all Army planes. Directions tell how to use each medicine - use them according to directions.

S A N I T A T I O N

Drinking water at all Air Transport Command stations is safe but when "in the bush" either use Halazone tablets (in first aid kits) to sterilize all drinking water, or boil it.

Military establishments are the safest places to eat throughout this region. The Medical Officer at any station should be consulted on local matters of sanitation.

PERSONAL HYGIENE

FOOD

1. Food supplies heat to our body. Eat lots of substantial food with liberal quantities of meat and fats.

CLOTHING

2. Dress warmly, using multiple layers of wool clothing which do not constrict body. Protect ears, fingers and feet against the cold. Remove damp clothing at once and dry it.

EXERCISE

3. In cold weather, as the intensity of exercise increases the amount of clothing worn should decrease. This will tend to prevent perspiration and its consequent dangers. On the other hand, keep moving enough during sub-zero weather to maintain good circulation throughout the body.

4. Do not drink alcoholic beverages and go out into cold weather. It gives an immediate false feeling of warmth but later makes one much colder. Alcohol and extreme cold constitute a good formula for a quiet and painless death by freezing.

DO NOT FEAR THE ARCTIC AND ITS WEATHER BUT TAKE PROPER PRECAUTIONS, PROTECT YOURSELF, AND ENJOY IT.

ARMY AIR FORCES
WING HEADQUARTERS
STATION NO. 1, ATC, APO 462
c/o PM, MINNEAPOLIS, MINNESOTA

30 January 1944

SUBJECT: Operating Instructions for the 578A Emergency Transmitter.

TO : All Station Commanders. Alaskan Wing.

1. As a result of cold weather tests recently conducted by this Headquarters, operating instructions for the 578A Emergency Transmitter, on inland routes of the Alaskan Wing, are hereby amended as follows:

a. A ground rod will not be used and, instead, an additional roll of antenna wire will be carried, which will be connected to the "ground" wire of the transmitter and extended to its full length (approximately 300 feet) in an up-wing direction. The wire may rest on the ground, but if there are trees in the area it may be raised for better results. This wire is called a "counterpoise".

b. The kite will be used for elevating the antenna. In the event heavily wooded terrain or calm air prevents raising the kite, the antenna will be extended to its full length in a direction opposite to, and in line with the counterpoise. The antenna may rest on the ground, but better results will be had if it can be elevated by stretching between trees. In this case, the counterpoise need not necessarily follow an up-wind direction. The desired result is to have as much wire as possible between the far end of the antenna and the far end of the counterpoise in as straight a line as possible. Where both the counterpoise and the antenna are extended along the ground, there should be approximately 600 feet between the end of the counterpoise and the end of the antenna, with the transmitting unit in the center.

c. In heavily wooded areas, the antenna and the counterpoise may have to be interlaced between trees and through or over shrub. However, where it is possible to choose a site, it should be so picked that both the antenna and the counterpoise will be in the clear and elevated as high as possible.

2. Due to its weight and to the difficulty experienced

in gas generation, balloon equipment will not be carried on fighter aircraft.

3. As outlined in the first paragraph, the tests were primarily for cold weather operation. Results would be unsatisfactory in wet weather where the antenna and counterpoise would "ground" to anything with which they came in contact. Under these conditions, both the antenna and the counterpoise must be clear of tree branches and supported off the ground. Aircraft antenna insulators will be provided for this type of operation.

4. It is directed that aircraft operating in the Alaskan Wing carry three rolls of antenna wire (one in the transmitter case, one additional roll for the counterpoise, and one spare), four aircraft type antenna insulators, one kite, and the 578A Emergency Transmitter.

5. All pilots will be briefed in the operation of this equipment.

By Command of Brigadier General GAFFNEY:

C O P Y

/s/ Paul E. Greiner
PAUL E. GREINER,
Lt. Colonel, Air Corps,
Ass't. Chief of Staff,
Operations.

Reward: -- The US AAF at Edmonton now pays a \$100 reward for information leading to the discovery of any lost or disabled pilot or crew member whether dead or alive. This fact is advertised by posters designed by Major Westover and hung in various prominent places. For a sample of the poster, see Dr. Gould's office. The offer of a reward raises flyers morale and can also save the government thousands of dollars spent in fruitless search by insuring prompt report of any discovery of lost personnel.

HISTORY

557TH AAF BU - ATC
7TH FERRYING GROUP
Ferrying Division
Air Transport Command
Great Falls, Montana

January 1942 - December 1944

THE ROUTE

(of all evil)

OR

"SO YOU WANT TO GO TO ALASKA"

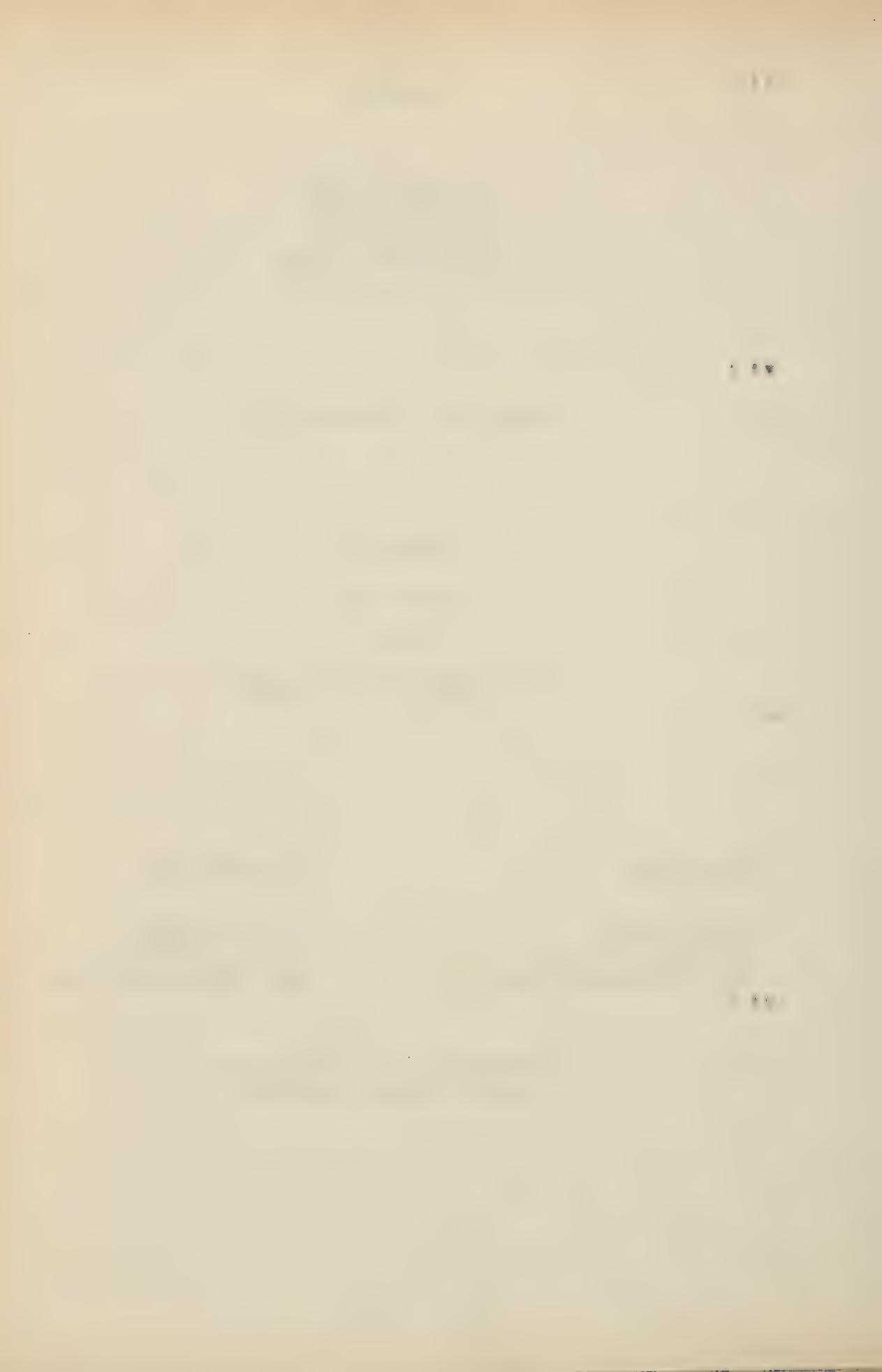
Written By

BISHOP WHITE,
Captain, Air Corps,
Hqs, 7th Ferrying Group

Illustrated By

LESTER H. BAKER,
Captain, Air Corps,
Hqs, 7th Ferrying Group

(Written and illustrated under
per diem weather conditions)



Perhaps you are an Old Ferry Pilot and have flown both ponds many times. Perhaps you have been on instruments for ten hours and looked down to find Hickam Field right under you. Or perhaps you are a brand new member of the Per Diem Fraternity just starting on your career as a Northern Route pilot, and don't as yet even belong to the Watson Lake Chapter of the N.P.A.* Whichever you are, if you are contemplating a sojourn in the land of the "Cremation of Sam McGee", there are a few little details to check up on before packing your fishing equipment and brushing up on your Eskimo etiquette. There are many problems on top of the world, which don't arise around its waist-line, and, if you think life can be beautiful, maybe you'd better have a speaking acquaintance with some of these phenomena.

"I'm the guy who knew
all the answers but
didn't read this
booklet."



Before you start delivering Time Bombs to Uncle Joe Stalin, you will want to become acquainted with the nearly two-thousand miles of land between Murrill's Bar in Great Falls and the Wagon Wheel in Fairbanks, an expanse of terrain commonly known as the "Route". You also might want to know about Mary and Lula at Edmonton, but then they come under the heading of "Hazards of the Northern Route".

*Nose Picker's Association

The route runs just east of the main backbone of the Rocky Mountains all the way to Fairbanks over country which progresses from plains into mountains and, at Northway, back into plains again. In the summer it is warm, swampy and buggy. In the winter it is cold, frozen, and windy. The weather is always capricious, and it makes a definite effort to get you. The fishing is good; the country is beautiful; the social life, except in Edmonton and Fairbanks, is non-existent unless you are attracted to bears.

NO! NO! A THOUSAND

TIMES NO!

III.



If You Like Bears

Most of the route is through a source region for weather and gets quite a lot of the same stuff that keeps the Aleutians socked in most of the time. In winter especially, fronts parade with astounding regularity from the Aleutian low east to the mountains, where they either dissipate or hide, and then pour down over the route when you least expect them.

All the airports on the route are so big and the runways so long that only a character of very questionable talent will overshoot very often.

The biggest facilities for repair are installed at Edmonton and Whitehorse, but often the best work is done at the smaller stations.

Edmonton is the Headquarters of the Alaskan Wing. The natives are definitely friendly, and the females do their best to assure pleasant international feelings. Here you can check your equipment, supplement it if necessary, and have your plane thoroughly inspected.

Whitehorse is the next station which carries some replacement parts, and which has a fairly large staff of mechanics. Whitehorse is beginning to get civilized. It is overflowing with gravel-agitators, and feather-merchants appear all through the surrounding territory. As time goes by, this station will offer better and better facilities for repair, replacement, servicing, and entertainment. At present, replacement parts are stocked in quantity only at Fairbanks and Edmonton, and are flown when needed, more or less quickly, to the small stations.

Generally you will deliver your airplane at Fairbanks. You will probably see people there called Russians. Russians are people who slap you on the back and say, "Boogie-woogie, okey-dokey, coca-cola", and then they laugh like hell. They jump into airplanes, taxi a few feet, and take off down-wind on a taxi strip. They are pretty nice guys and just naturally don't give a happy damn. At Fairbanks, you and the other Ferry pilots will be weighed, sorted, and stacked, then loaded into a transport for delivery back to Great Falls. This usually happens in the middle of the night, about three hours before take-off, and every effort is made to stack the pilots in nice even layers to make room for other cargo.





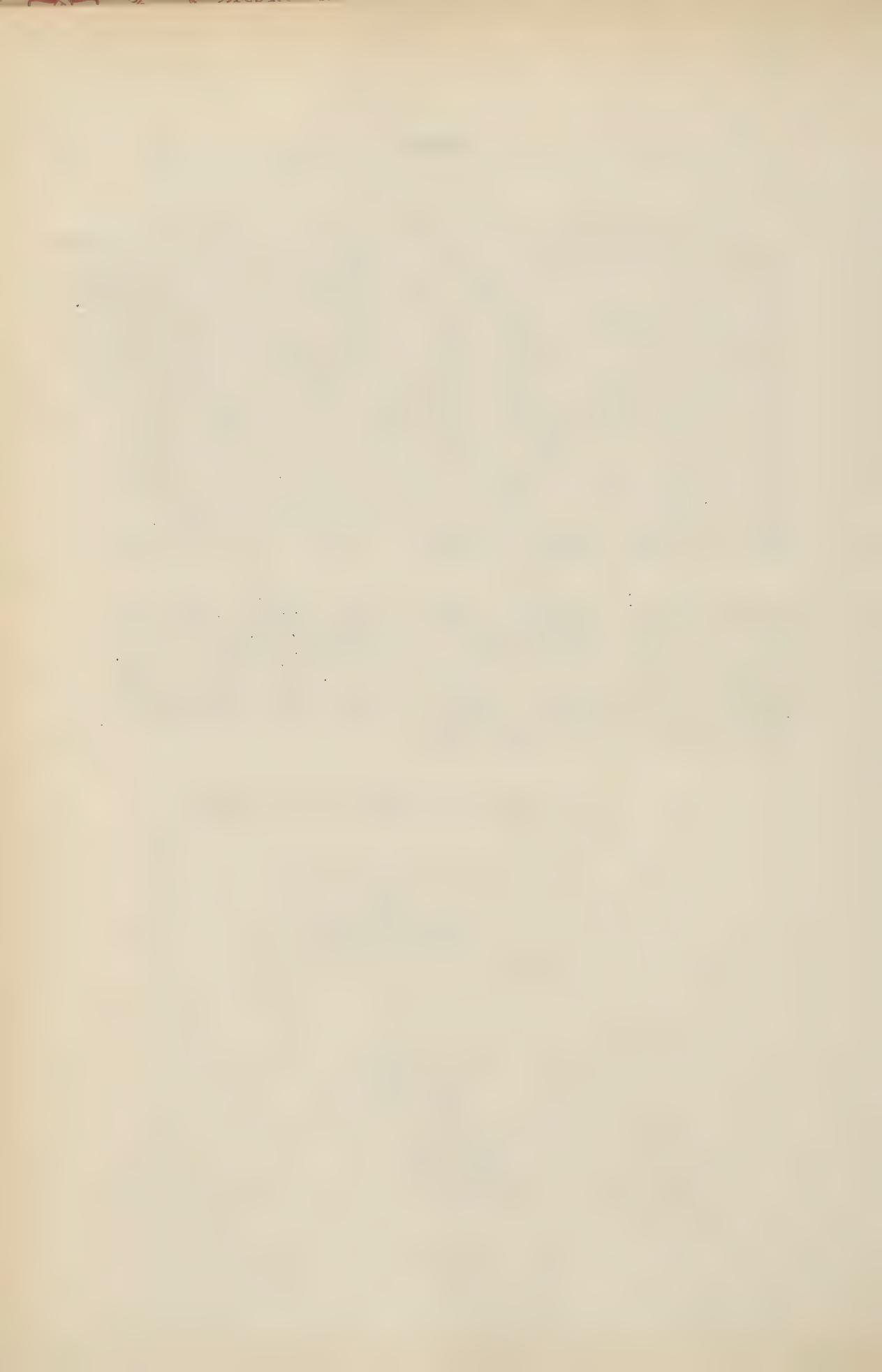
WEATHER

If you're flying north in planes that don't mix with weather too well, or if you are allergic to flying with needle, ball, and air-speed (or needle, ball, and coolant), you might remember that everyone on the northern route must be his own weather man. The weather develops faster than Mrs. Dionne's waistline, and disappears just as quickly. Most of the weather on the route, except that caused by local convective activity, is caused by the moving of moist air from the ocean, west to east, until it runs into the cold, dry air over Canada. The weather caused by the resultant mixture is most severe on the coast and in the mountains; and, while often it is possible to fly along the road with bilious-looking clouds in the mountains to the west and blue skies to the east, it is impossible to tell when the weather will spill out over the route and either cut you off in front, behind, or both.

In summer, thunderstorms are the most frequent form of weather, and line squalls do occur. Extensively cloudy conditions of extreme duration occur infrequently; however, the weather is always fast developing, and, in this season, heavy turbulence is frequent. In the summer you will often find the violent and unpredictable weather, and the most impermanent. Summer weather is generally local.

"At least I'm STILL flying contact."





Fall and Spring are inclined to be as messy and unpredictable as combing Grandfather's beard after Christmas dinner. Winter and Summer weather get all tangled up in each other, and fogs are common. In the Fall and Spring, one day may be cold, and the next warm, so it's a good time to expect anything.

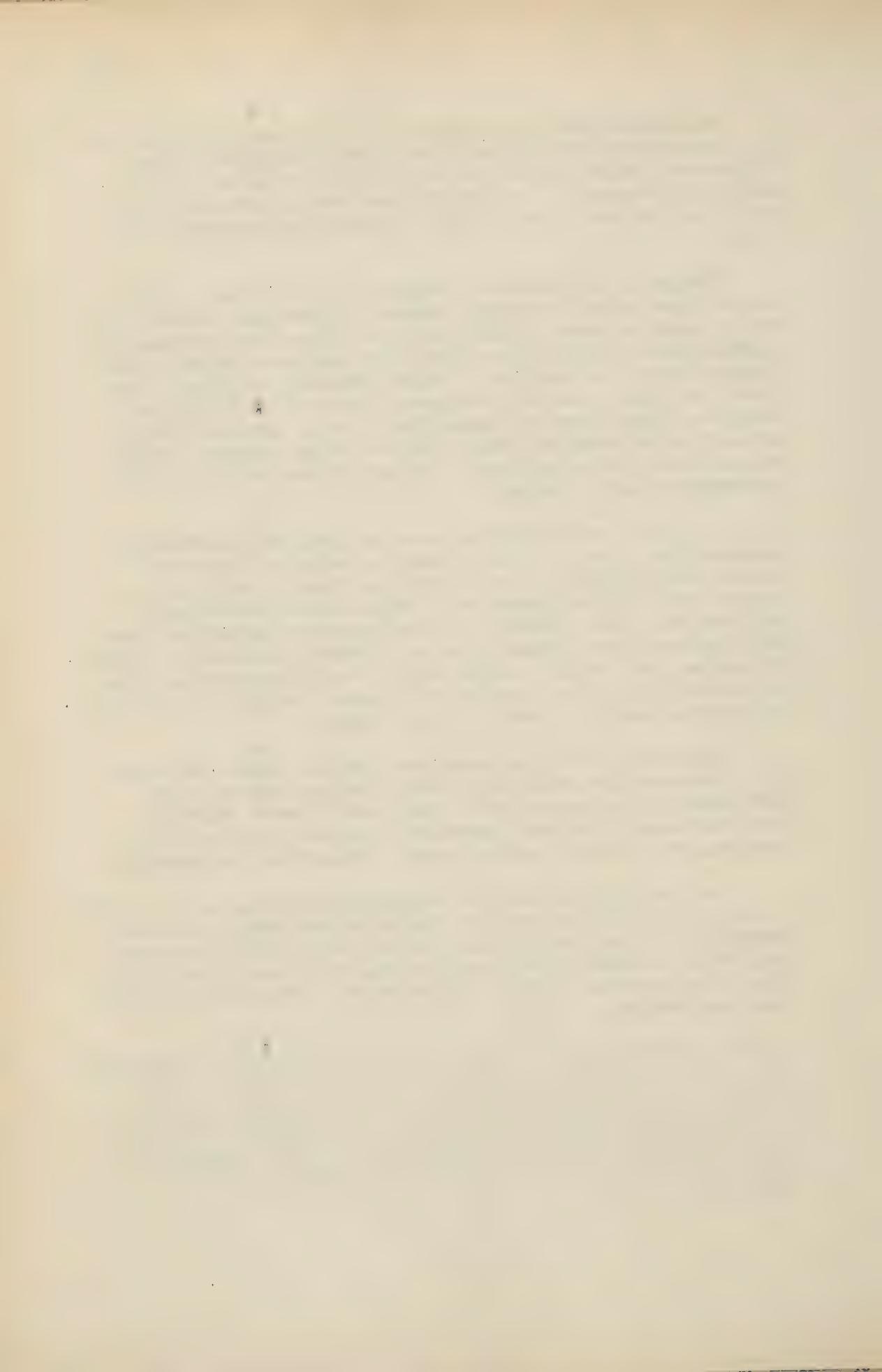
Winter is the season of seasons up on the route. The natives are bored with other seasons. Characters who are new to the country start thinking they are rugged and go around passing out the information that they have been colder on the Hoboken Ferry, so they don't bother with many clothes. They don't feel cold even if the thermometer says it's -40, but sooner or later they will make their little addition to the collection of detached ears, toes, and other trophies which are on hand at most stations. No matter how you feel, the thermometer isn't kidding.

In Winter, occluded fronts moving from the Aleutian low eastward get a nasty habit of chasing each other over our route quite regularly. Even after the front itself passes, a great deal of low, messy stuff hangs around the valleys and over the road. This causes bad weather reports from some stations when the weather is actually very adequate for flying. Of course, the frontal weather itself is foul and often hangs around for days. You can find all kinds of stuff in the front, and getting caught in one is a good laxative.

This brings us to sequence and synoptic maps. Sequences are little garbled messages on the teletype that tell you what kind of weather you would have had if you'd taken off two hours ago. The most important thing they show on the northern route is the weather trend. This trend is important.

You also might notice the temperature and dew point spread. If they are too close, you are liable to get spread yourself. Remember the reporting weather stations are pretty far apart, and, while more are being established, if you would get a good idea of the weather picture, you must study the subject and use your imagination.

The synoptic map is a picture of the weather in technicolor. It is figured out by prophets and medicine men with the help of a Ouija Board. It shows what kind of weather is on the way. A character possessing perspicacity and an instinct for self-preservation can match the synoptic map and the sequences to get an answer to the sixty-four dollar question: "Shall I take off?"



At Fort Nelson they have a sign in the weather office. It reads like this: "Famous last words - Let us go out and take a look at it". This is right in some ways, but "Taking a look at it" is often very necessary if you want to deliver before you're an old man. But if you are going to "Take a look at it", you must remember that the weather behind you is more important than the weather in front, and that the most intelligent maneuver of all is the 180° turn. Of course, using a 180° turn is no good if the weather has closed in on the station you departed from. To be half way in between two socked in stations is a good way to make hell more crowded than it is already. Wing icing exists on the route at all seasons, but it is not difficult to avoid, if you watch out for it. Find out where the zero isotherm is - don't let it find you. In the Summer wing ice occurs mostly in cumulus clouds and thunderstorms. It is the same as anywhere else, and you can keep out of it easily. In all seasons ice occurs in stratus formations, but again there is nothing abnormal about it, and you can keep out of it just the same as anywhere else.

In the Winter, a temperature inversion exists over the route most of the time, so even though it is too cold for wing ice on the ground, it is no sign that you won't be flying the ice-wagon soon after you leave the runway.

Carburetor icing exists under the same conditions as anywhere else, and intelligent use of carburetor heat is still the remedy for it.

Ice fog and arctic smoke are two common phenomena. While they don't limit vertical visibility, they mess up horizontal visibility plenty and materially increase one's chances of being spitted on a tree like a hot dog, while trying to land.

If you get caught in a snow storm, the best thing to do is to get out of it, even though it is not particularly dangerous and only local. You have no business in a snow storm anyhow, unless you have a plane that is safe for instrument flying, and unless you are an instrument pilot. But if you do get in one, switch your radio to the loop antenna immediately. Nothing else will give you anything except nasty noises. Don't fly low in snow squalls of any sort, since even light snow impedes horizontal visibility greatly, though your vertical visibility may be not greatly affected. On the ground, as far as pilots are concerned, snow is just something that covers the earth instead of grass, except that it makes runways slippery and is very apt to ruin your depth perception when the sun is bright. Caution is the cure for both of these difficulties.

Frost forms under several conditions on the northern route. It forms on planes parked over-night, on planes taxiing out for take-off, on windshields after take-off if a temperature inversion is present, and on beer glasses at Edmonton if you are weathered in. No frost or anything vaguely like it occurs around Mary cr Lulu, and the hazards they represent are quite different. In fact, some seasoned pilots swear that Lula surpasses the most violent front they ever came into contact with.

Frost must be swept or melted from all parts of your plane before take-off, since, even though it looks harmless and thin, it spoils airfoils, creates drag, and increases the take-off speed. If frost forms while taxiing out for take-off, go back and get rid of it. If frost forms on your windshield just after take-off, it is due to a temperature inversion. Your plane which is at ground temperature is passing through a warmer layer of air than that on the ground. You will also probably be leaving a vapor trail. When this happens, don't get worried. Look out your side windows and use your instruments and your windshield will clear.

High winds can occasionally be found on all parts of the route at all altitudes. They can make landings risky, create blowing dust, and make navigation, while on instruments, more difficult. They are really just a minor difficulty, however, and are not frequently violent enough to form a major hazard. In fact, Yukon turkey and Spam are much more detrimental to smooth and untroubled flying.

MECHANICAL

Thorough knowledge of the ship he is flying is the pilot's most important contribution to the prevention of mechanical troubles on any route at any time, and in any airplane. Familiarity of this sort will never breed contempt. Knowing an airplane is like knowing a woman -- you never know what the possibilities are until you tinker around with them, and just like a woman, a lot of attention is necessary to get results. Care for your ship and it will care for you.



Just Like A Woman



To Get Results



YOU NEVER KNOW THE POSSIBILITIES

Don't forget that most of the planes we deliver north have less than ten hours on them when they reach Great Brawls, Montana, and they have not actually received a thorough breaking or shakedown. This is accomplished on the way to Fairbanks. Things will often crop up which need attention, and you will not always have expert mechanics around, so knowing your plane is important. On the route you will find some of the finest mechanics in the world, but theirs is a big job, and often your plane will be worked on by mechanics of brief experience.

Tech Orders and handbooks are fine, and reading them won't hurt you very much, but if you really want to study your plane, see the experienced mechanics or the factory representatives along the route, and watch mechanics make repairs on your plane. A specific mechanical difficulty is liable to occur on all planes of one series of a type. It is wise to know what such trouble is and to be alert for it. Try to prevent mechanical trouble before it occurs.

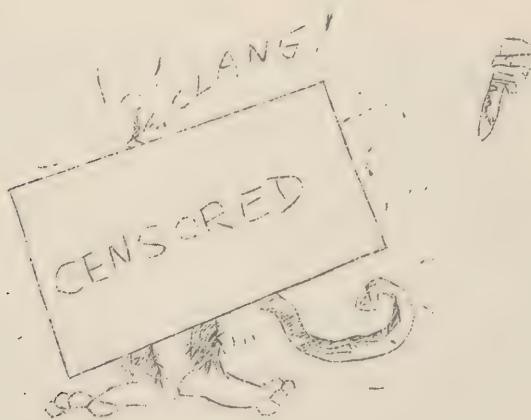
You can prevent a great deal of trouble by exercising care and thoroughness in your preflight check and run-up. Be satisfied with your plane before you take it far from the field. You wouldn't buy a horse with three legs, so why should you ferry a ship with number three cylinder not firing?

No specific mechanical failures are caused by the summer climate, and no special precautions are necessary. Use fairly short run-ups and keep engines cool. The northern climate is practically perfect in the summer - mechanically speaking.

Winter flying up north is so hard on airplanes that the Army Air Forces have a Cold Weather Test Unit at Fairbanks which flies all types of military planes through tests to determine future improvements. The Cold Weather Test boys don't do ferry pilots much good except in the way of an occasional drink, but the results of their tests show up in the planes we fly.

Temperatures up north in the winter get as low as -75° Fahrenheit. Even brass monkeys will admit this is cold. This condition alone is a great source of trouble. It is liable to freeze you-in the end.

It may often be necessary to take off with carburetor heat on since at extremely low temperatures fuel does not vaporize sufficiently to give good combustion. Use carburetor heat wisely and soon - it's intelligent.



PICTURE OF THE BRASS MONKEY
THAT WAS COLD

When starting engines at low temperatures you must use lots of prime, so don't think something is wrong if your engine doesn't start on a couple of shots. It takes more than that to start you. After the engine does kick, check your oil pressure immediately, and stop it if the pressure doesn't come up immediately.

After you are in the air, work your gear and flaps through a few times to get rid of snow, ice, or moisture so that they won't stick in the up position. If your oil or coolant temperature goes up in flight on a cold day close your shutters, don't open them. The chances are that your oil or coolant has become sluggish or congealed. Closed shutter, not Carter's Little Liver Pills, is the answer.

Always pre-heat your plane thoroughly, and use oil immersion heaters, or drain your oil for storage in a hangar where you RON. The longer and more thoroughly you pre-heat your plane, the safer you are and the easier it is on your plane. Also, don't forget to dilute your oil.

In winter you will find that struts will leak, and tires will lock flat. You don't do much about leaking struts except check them for fluid level and be sure not to fill them too full. Tires must be filled at moderate temperatures, preferably in a hangar, since, if they are filled to normal pressure with cold air they will heat up when the wheels are retracted and are liable to go "bang" when the air expands. Contraction of materials sometimes accounts for loose fittings and connections, too.

You may think you've had the Sunday morning shakes, but wait 'til you start a plane before it is warm. The intense vibrations caused by starting an engine before heat has been applied can shatter glass, damage instruments, and break or loosen fittings. In flight, use enough power on the final approach to keep your temperature up. Just like your pants, you may need your engine quickly in an emergency.

Oil dilution is very important, but like GI underwear, it is a ticklish proposition. Most of the mechanics know the subject pretty well by experience. The most intelligent dilution procedures at very low temperatures are not always the ones you finally unearth in the Tech Orders. Many pilots believe in very moderate dilution and a great deal of preheating. The reason for this is the relatively high temperature necessary for properly and quickly scavenging gasoline from the oil system in a flight. Many engines will not easily reach and maintain temperatures high enough for quick, efficient scavenging

in flight under extremely cold conditions. Oil temperatures must be fairly high or the gas won't vaporize out of oil, and there you are flying all over God knows where with a fire hazard on board. This subject can stand plenty of thought, and nobody has the only perfect solution. Generally speaking, most northern pilots agree that it's never wise to dilute over four minutes, and that two minutes is about the best dilution period. This, of course, is governed by the type of engine.

Vigilance, knowledge, and foresight are the watch words for the prevention of mechanical trouble. Catch trouble before it becomes serious by good pre-flights and inspections.

NAVIGATION

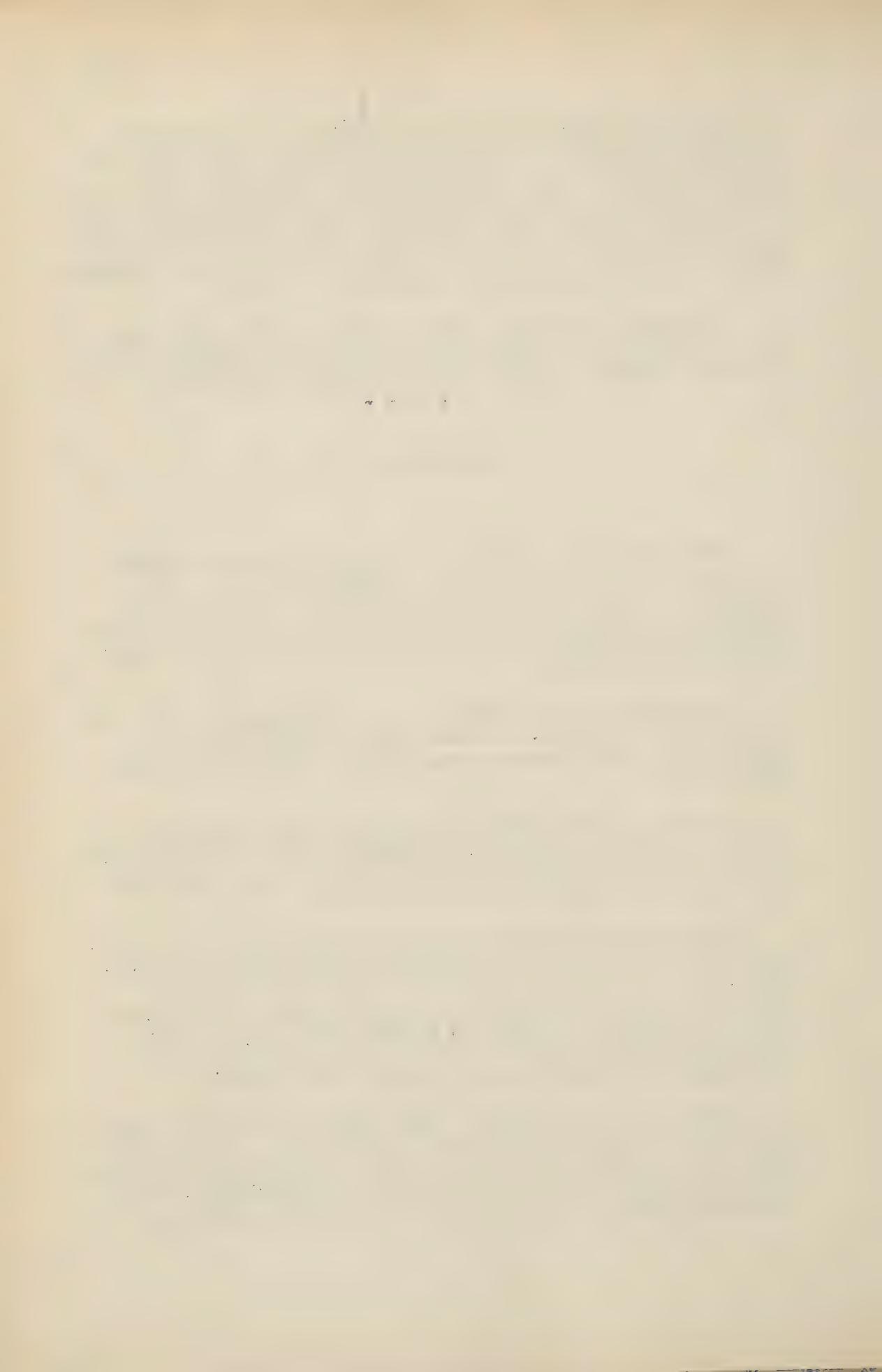
Good navigation is getting back to the wife and kiddies in one piece. Bad navigation is becoming wolf bait. Good navigation is knowing the country, using all aids available, knowing your gas supply and consumption, and being alert. Bad navigation is taking the scenic route to a wooden shirt with your head up and locked.

The northern route offers the usual navigational aids with a few peculiar twists. You will have at your disposal maps, radio ranges, army airways communications, and control towers. Use them all.

The maps of the route are becoming better and better. In addition to regional charts, strip maps are now available. Not all the data on the maps is correct; but the inaccuracies may be corrected at Great Falls before leaving.

New features such as emergency landing strips are appearing on the route, and it is necessary to keep the maps up-to-date. It is wise to use your maps frequently to pin-point yourself, taking into consideration time, speed, and distance. When you get lost up north, one valley looks like the next. Land marks which are familiar when you know where you are, look completely unfamiliar when you are under strain.

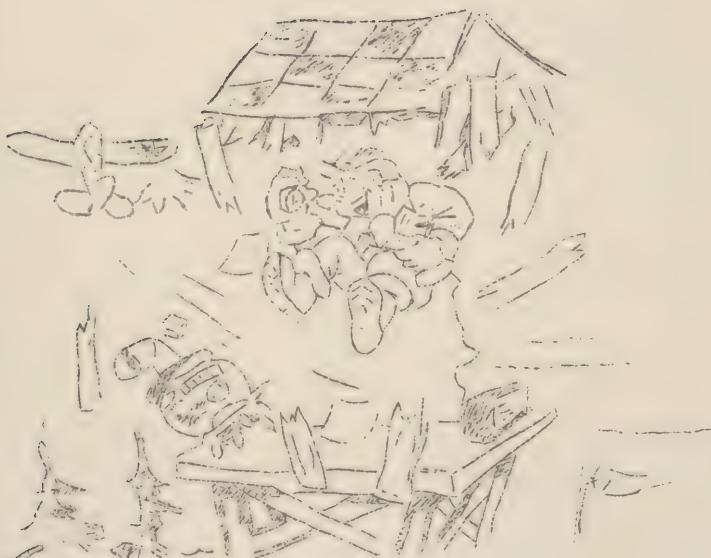
Radio ranges up north are being improved constantly, but many beams have splits, dog legs, and multiples. Beams often fade out in the mountains, and sometimes atmospheric conditions cause static sufficient to drive you to stop drinking. False builds and fades are also very common. Use the radio range



always, but remember their failings.

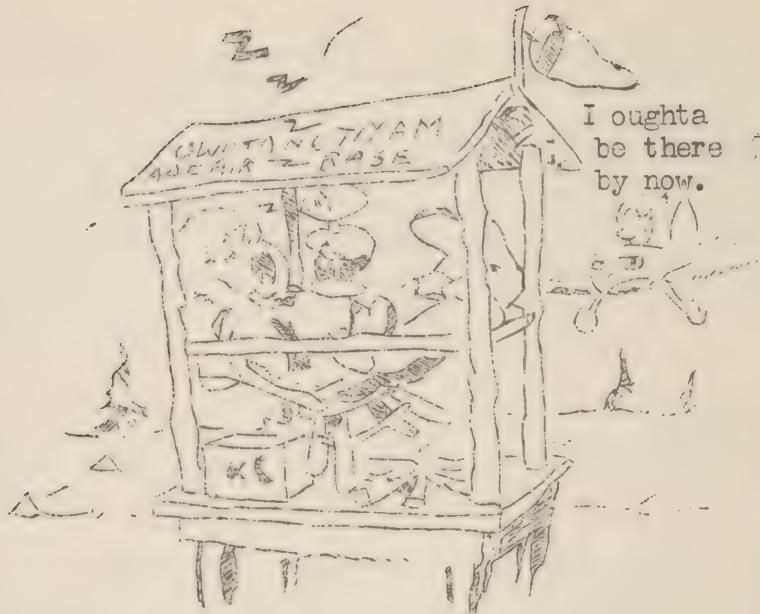
The radio compass is quite an accomplished liar on the mountainous section of the route. It is amusing to turn your radio compass on and watch it point to the tallest mountain in the vicinity. Following it is not so amusing.

"BOY! ETA right
on the nose!"



In weather, most Army pilots agree that the loop gives the best reception and cuts out most of the static. Homing on an oral null will also give good results.

Proper mixing of pilotage, dead reckoning, and radio navigation will result in a smooth navigational cocktail, with no unpleasant after effects.



A word on the towers. Some tower operators are very comical characters. One individual gave two P-39's clearances to land and after the first one got down, he went out on his little cat-walk to watch the other one land. It landed on the belly without benefit of wheels, and the tower operator just laughed and laughed, because he knew he could have prevented it if he'd stayed by his radio. There is another quaint fellow who brings in planes from opposite directions at the same time - just for laughs.

The Alcan highway is a ribbon of safety for the northern flyer. Know on which side of it you are at all times, even if you are not following it. When flying one-engine aircraft, stay close to the road if possible, since, if you have to part company with your ship, you will probably be seen and picked up quicker. The highway lies fairly close to airways all the way from Dawson Creek to Fairbanks. If you know which side of the highway you're on, you can find yourself, if you can see the ground.

SURVIVAL

Perhaps Rosy the Riveter, at the factory where your mount was male, turned around to whistle at a visiting pilot and drove one rivet through your fuel line and another into Maizie the Welder's chief social asset. Then maybe everybody was so busy repairing Maizie's trousers that they forgot about the fuel line in your airplane. Maybe the line holds out to half way between Watson Lake and Whitehorse, and then suddenly you find yourself drifting leisurely earthward with a silk umbrella, wondering if you have enough cigarettes to last until someone comes to get you.

Now the most pressing matter on hand, except the cigarette situation, is just how to set up housekeeping, or how to inflict your company on other poor humans at the earliest possible date. You might give this some thought on the way down.

If you crash land your plane, or land near the crash after bailing out, you can use lots of parts from the plane for tools, utensils, clothing, materials, etc. If you bail out and land far from the crash, you can live with the help of your Arctic Pack.

The first thing to remember if you get set afoot in the Arctic is to try like crazy to get found immediately. Your chances of being found are greater at once, and decrease as time goes by. While you are doing your best to get found, you also have to stay alive and in good condition in case you have to try walking out.

First of all, stay by your plane, if possible, and start a fire immediately for warmth and to guide searchers from the air or on the ground. Keep alert for searching planes, and use your flare gun to signal them. If you are near your plane, or part of it, keep the snow off it. Later trace SCS in the snow with evergreen brush or trees. Unless you are very close to the road, or an airfield, stay in one place for at least a week and try to make it obvious that you are there. Canadian Mounties say that five miles travel a day is exceptional in the woods. Brush is heavy, and in the summer the land is apt to be swampy. In the winter, snow is deep.

All the time that you are making every effort to keep your position obvious to searchers, you must stay alive and healthy. You must, above all, stay just like at ground school --warm and dry. Keep a fire going at all times, and then go about building,

in a sheltered spot, a lean-to out of small trees, and cover it thickly with branches. Use evergreen branches to make a floor for your lean-to after scraping the snow from the earth.

If you are near your plane, you can use parts of it for your shelter and tools. You can use the oil and gas to start fires, and make smoke signals, and the rations stored in it to help the gastronomic situation. If you are not near your plane, use what you have in your back pack, but use it economically. If you are without a bed roll, use your parachute to sleep in, and keep your fire going strong all the time.

SNARED



Dry your clothes thoroughly and keep them dry. Don't sweat. Take off excess clothes for working. Keep your socks, especially, thoroughly free from moisture. If you are good at snares, and improvised traps, you can catch small game. Don't try to live on rabbit alone, though; because if you do, all your strength will go to your ears, and you won't have any anywhere else. There are fish in all streams and flies in your back pack. Fish will keep you healthy forever. Grouse can be knocked down with a rock, if you can find them--they're not too smart. If you can get a .22 cal. pistol, it's a good deal. If you have a .45 automatic, it won't help you much, (even if you can hit something, which is doubtful) since it practically



disintegrates anything smaller than a moose. One pilot shot two rabbits at once when he was set afoot in the brush, and all he could find was a few tufts of gory fur. If you can boil your food, do it. If not, roast it. However you cook it, cook it rare, or eat it raw.

Anyhow, after you've set up housekeeping, don't fail to do everything in the world to attract attention, and keep your flare gun constantly at your side, and keep a fire going at all times; but if it's a pine fire, don't sleep too close to it. Don't forget three shots fired close together are recognized by trappers as a distress signal.

TRAVELING

If you are set afoot, and you are far from your course and lost, and/or if you have waited a few days and seen no airplane, you may decide to try to walk somewhere. If you decide this, there is only one thing to do; GET TO A STREAM OR RIVER, and follow it down-stream. Do not follow deer trails, or moose trails. They are intended only for deer or moose.

Streams and rivers mean fish, people, water, easier walking and cigarettes. Rivers are the main highways in the north, and are about the only places where people live or have cabins. Trappers use the rivers, and you certainly can use the trappers, or at least their cabins. If you follow a river long enough, you will find some sort of settlement.

While you are traveling, take time out to sleep well, and build a fire everytime you RON in the brush. You must stay rested to survive. It is more important than eating.

Travel only when the weather is friendly. When it is bad, camp and loaf by the fire. Don't ever keep traveling until you are exhausted. Always have enough energy left to build a big fire and make yourself WARM, DRY, and comfortable.

If parts of your body get frozen, restore them with heat from some warmer part of the body. Never rub frozen spots.

Take the following items in your back pack, use your

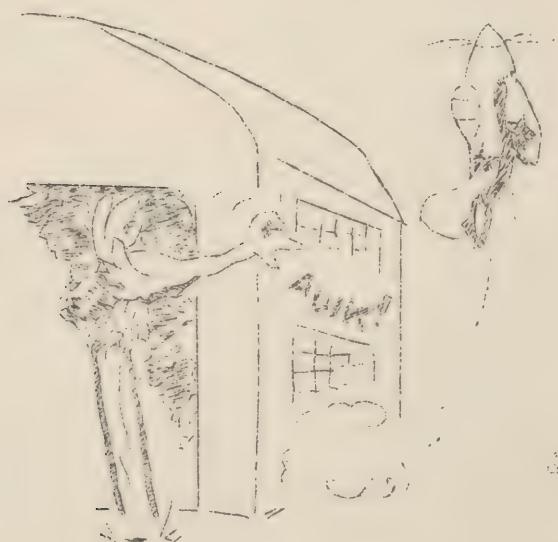
imagination, and be sure to see the Army Training film "Land and Live in the Arctic" before you go up the northern route.

ITEMS FOR BACK PACK

At least two pairs of Arctic socks	Machete
Matches, In water-proof match boxes	Rations
Signaling Pistol (Navy type)	Compass
Safety Wire (About 10 ft. for making snares)	Gloves
Extra ammunition for .45 Cal. pistol, (bird shot loaded)	Pocket Knife
Fishing Kit	First Aid Kit
Fire Starter	Candles
Dark Glasses	Frying Pan
Signaling Mirror	

Before stopping this rather garrulous narrative, it might be well to mention the fact that the "Route" is getting more and more civilized, and all facilities are getting better and better. Don't let this fact make you careless - it still isn't as easy as riding a pogo-stick in good weather on a paved sidewalk. Of course, things are getting civilized. One clown buzzed a shack just outside of Big Delta a little while ago, and was grounded for two months afterward. After he got to Fairbanks, he found out he'd just buzzed the newest branch office of the White Castle Hamburger Co.

Happy Per Diem!



* * * * *

The emergency equipment used consists of the standard B-8 parachute and B-24 emergency kit. As a sleeping bag is fastened in the parachute, the pilots usually remove the poncho from the kit and substitute extra long woolen underwear and heavy wool socks. A navy type flare pistol was supplied instead of the flares.

The pilots' security is increased by classes in arctic survival, in which they learn methods of obtaining food and shelter by their own ingenuity. Radio communication subsequently improved and legs between emergency strips were shortened to approximately 100 miles.

PART THREE - EMERGENCY EQUIPMENT

EMERGENCY EQUIPMENT PLACED IN FUSELAGE
OF AT-11 AND UC-64 AIRCRAFT
29 JUNE 1944

1 Walkie Talkie
1 Emergency Drop Kit
1 Emergency Kit
1 Flare Pistol
3 Red Flares
3 Green Flares
4 Yellow Streamers
1 Message Pad
1 Message Flashlight A-6
1 Dropkit Flashlight

THE FOLLOWING LIST OF EQUIPMENT IS INCLUDED IN THE EMERGENCY
KIT IN AT-11 & UC-64 AIRCRAFT ASSIGNED TO EDMONTON AIR BASE
PLACED IN AIRCRAFT 29 JUNE 1944

<u>FOOD</u>		<u>AMOUNT</u>
Soup, Green Pea, (Dehyd.)		5 lbs
Potatoes, (Dehyd.)		6 lbs
Rice		6 lbs
Bacon, canned (one can)		5 lbs
Tea Bags		1 lb
Sugar		2 lbs
Salt		1 lb
Paisins		4 lbs
Bouillon cubes (60 cubes)		1 lb
C-Biscuit Ration (3 packages)		6 lbs
Pemmican (6 cans)		4 1/2 lbs

IMPLEMENT

Shovel, short handle, all purpose) Hang inside	1 ea
Axe, Hudson's Bay type) fuselage of	1 ea
Snowshoes, trail-breaking type*) plane	1 pr
Shelter halves (without pins)		2 ea
Cook set		1 ea
Mess Kit, complete with cup, fork, knife and spoon		3 ea
Can opener		1 ea
Matches (carton of small box type...not kitchen type)		1 carton
Repellent, mosquito, bottle		2 ea
Headnets, mosquito		6 ea
Gloves, lightweight		6 pr
Candles, 8" x 3/4"		3 ea
Kit, sewing		1 ea

<u>IMPLEMENT</u> (Contd)	<u>AMOUNT</u>
Bucket, canvas	1 ea
Compass, ass'y, Hunting case, pocket type	2 ea
Kit, fishing, emergency	1 ea
Knife, sheath, hunting	1 ea
Knife, butcher	1 ea
Game getter, .22 .410 cal.	1 ea
Ammunition .22 cal.	200 rounds
Ammunition .410 shot	150 rounds
Ammunition .410 slug	50 rounds
Starters, fire	2 ea
Grenades, smoke, red	2 ea
Safety pins	1 card
Box to hold above equipment	1 ea
TOTAL WEIGHT.....	90 lbs

*Not carried in summer.

62-4

AL DIV. MEMORANDUM }
NO. 62-4 }HEADQUARTERS ALASKAN DIVISION
AIR TRANSPORT COMMAND
APO 462 MINNEAPOLIS MINNESOTA
27 JULY 1944

FLYING SAFETY

Emergency Kits on Alaskan Wing Aircraft

1. The following kit, listed below, will be carried aboard all C-46 and C-47 type aircraft assigned to the Alaskan Division. All items can be drawn from local supply, with the exception of the Manhaul Sled Container which can be constructed locally:

- a. One (1) each, Sled, Manhaul Type.
- b. One (1) each, Canteen and Cup.
- c. One (1) each, Marble Gamegetter, Over-under Gun, .410 gage and 22 caliber.
- d. 25 Rds. .410 Ammunition No. 6 Chilled Shot.
- e. 25 Rds. .410 Ammunition Slug Load.
- f. 100 Rds. Ammunition, Ball, Caliber, 22 Long Rifle.
- g. Three (3) each, Mess Kits with knife, fork, spoon and cup.
- h. One (1) each, Flashlight.
- i. Four (4) each, Batteries, Flashlight.
- j. One (1) each, Knife, Hunting, 6 inch blade.
- k. Two (2) pair, Goggles, Ski and Snow.
- l. One (1) each, Shovel, Short Handle.
- m. Two (2) each, Compass, Pocket.
- n. Two (2) each, Starter, Fire, Ml.
- o. Two (2) each, Match Case, Waterproof, (with matches, kitchen wood).

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- p. One (1) each, Box Matches, Kitchen Wood.
- q. One (1) each, Axe, Hudson Bay Type, or equal.
- r. Emergency Food:

	<u>Quantity</u>	<u>Item</u>	<u>Amount</u>
(1)	1 Package	Green Pea, Yellow Pea & Navy Bean Soup (Dhyd)	8 lbs.
(2)	1 Package	Potatoes (Dhyd)	8 lbs.
(3)	1 Package	Rice	7 lbs.
(4)	1 Can	Bacon	5 lbs.
(5)	1 Box	Tea (bags)	1 lb.
(6)	1 Package	Sugar	2 lbs.
(7)	1 Package	Salt	1 lb.
(8)	1 Package	Raisins	5 lbs.
(9)	2 Boxes	Bouillon Cubes (20 cubes per box)	6-1/2 ozs.
(10)	2 Boxes	C-Biscuit Ration	2 lbs. 7 ozs.
(11)	10 Cans	Pemmican (12 oz. net per can)	7-1/2 lbs.

- s. One (1) each, Fishing Kit (in cardboard container), including:
 - (1) 50 Ft. Fishing Line
 - (2) One (1) each, Tin, Assorted Fishing Hooks.
 - (3) Two (2) each, Gut Leaders.
 - (4) Five (5) each, Sinkers, Lead.
 - (5) One (1) each, Box Assorted Flies.

(6) One (1) each, Daredevil Lure, or equal.

(7) One (1) each, Jar Salmon Eggs.

t. Three (3) each, Candles, Wax, 8" x 3/4".

u. One (1) pair, Snowshoes, trail-breaking (Winter only).

v. Ten (10) each, Headnets, Mosquito (Summer only).

2. The following is a list of the contents of a kit to be used on UC-64, AT-7, UC-45, and AT-11 type aircraft.

a. One (1) each, Canteen and Cup.

b. One (1) each, Mess Kit, complete with knife, fork and spoon.

c. One (1) Pair, Snow Goggles.

d. Emergency Food:

	<u>Quantity</u>	<u>Item</u>	<u>Amount</u>
(1)	1 Package	Green Pea, Yellow Pea Navy Ben Soup (Dhyd)	6 lbs.
(2)	1 Package	Potatoes (Dhyd)	6 lbs.
(3)	1 Package	Rice	6 lbs.
(4)	1 Can	Bacon	4 lbs.
(5)	1 Box	Tea Bags	1 lb.
(6)	1 Package	Sugar	2 lbs.
(7)	1 Package	Salt	1 lb.
(8)	1 Package	Raisins	3 lbs.
(9)	2 Boxes	Bouillon Cubes (20 per box)	6-1/2 ozs.
(10)	2 Boxes	C-Biscuit Ration	2 lb. 7 ozs.

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(11) 2 Cans	Pemmican (12 oz. net per can)	7-1/2 lbs.
-------------	-------------------------------	------------

e. One (1) Fishing Kit in Cardboard Container, including:

- (1) 50 Ft. Fishing Line.
- (2) One (1) each, Tins Assorted Fishing Hooks.
- (3) Two (2) each, Gut Leaders.
- (4) Five (5) each, Sinkers, Lead.
- (5) One (1) each, Box Assorted Flies.
- (6) One (1) each, Daredevil Lure, or equal.
- (7) One (1) each, Jar Salmon Eggs.

f. One (1) each, Flashlight.

g. Four (4) each, Batteries, Flashlight.

h. One (1) each, Knife, Hunting, 6 inch Blade.

i. One (1) each, Compass, Pocket.

j. One (1) each, Marble Gamegetter, Over-under Gun, .410 gage and 22 caliber.

k. 25 rounds .410 Ammunition, Number 6 Chilled Shot.

l. 25 rounds .410 Ammunition, Slug Load.

m. 50 rounds Ammunition, Ball, Caliber 22, long rifle.

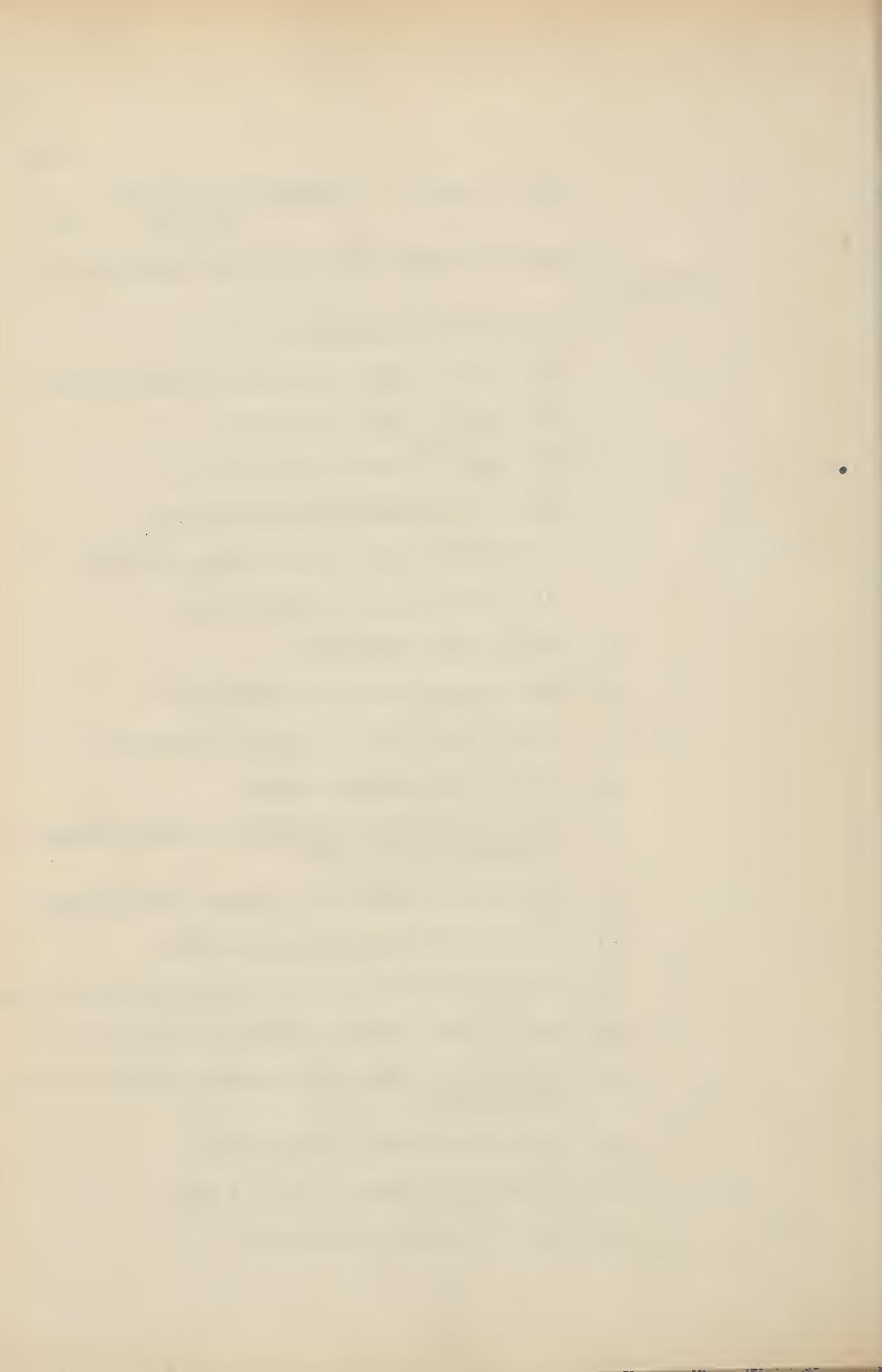
n. Four (4) each, Headnets, Mosquito (summer only).

o. Two (2) each, Match Cases, Waterproof (with matches, kitchen wood).

p. One (1) each, Shovel, Short Handle.

q. Two (2) each, Candles, Wax 8" x 3/4".

r. Two (2) each, Starter Fire M.



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s. One (1) pair, snowshoes, trail-breaking (winter only).

Note: Contents of this kit will be encased in a waterproof canvas bag.

3. The shovel, axe, and snowshoes will be tied to the outside of the kit.

4. The Flight Emergencies Officer will be responsible for the completeness of these kits, and will make a monthly inspection of its condition. A number will be assigned to each kit, and a record kept of its location.

By command of Brigadier General GAFFNEY:

PAUL E. GREINER,
Lt. Colonel, Air Corps,
Ass't. Chief of Staff,
Operations.

OFFICIAL:

/s/ R. P. Wilson
R. P. WILSON
Lt. Colonel, Air Corps,
Acting Adjutant General.

DISTRIBUTION: "A"



62-4

ALSD MEMORANDUM)
NO. 62-4)HEADQUARTERS ALASKAN DIVISION
AIR TRANSPORT COMMAND
APO 462 MINNEAPOLIS MINNESOTA
29 JANUARY 1945

FLYING SAFETY

Emergency Kits on Alaskan Division Aircraft
 (This Memorandum supersedes ALSD Memorandum 62-4, dated 27 July 1944, and ALSD Memorandum 62-4A, dated 30 September 1944, subject same as above).

1. The following kit, listed below, will be carried aboard all C-46 and C-47 type aircraft assigned to the Alaskan Division. All items can be drawn from local supply, with the exception of the Manhaul Sled Container which can be constructed locally:

- a. One (1) each, Sled, Manhaul Type.
- b. One (1) each, Canteen and Cup.
- c. One (1) each, Marble Gamegetter, Over-under Gun, .410 gauge and 22 caliber.
- d. 25 Rounds .410 Ammunition, No. 6 Chilled Shot.
- e. 25 Rounds .410 Ammunition, Slug Load.
- f. 100 Rounds Ammunition, Ball, Caliber 22 Long Rifle.
- g. Three (3) each, Mess Kits with knife, fork, spoon and cup.
- h. One (1) each, Flashlight.
- i. Four (4) each, Batteries, Flashlight.
- j. One (1) each, Knife, Hunting, 6 inch blade.
- k. Two (2) pair Goggles, Ski and Snow.
- l. One (1) each, Shovel, Short Handle.
- m. Two (2) each, Compass, Pocket.
- n. Two (2) each, Starter, Fire, M1.

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- o. Two (2) each, Match Case, Waterproof, (with matches, kitchen wood).
- p. One (1) each, Box Matches, Kitchen, Wood (packed in noninflammable container).
- q. One (1) each, Axe, Hulson Bay Type, or equal.
- r. One (1) each, File (6") flat mill bastard, 6" Class 7900 Stock #297100.
- s. Emergency Food:

<u>Quantity</u>	<u>Item</u>	<u>Amount</u>
(1) 1 Package	Green Pea, Yellow Pea & Navy Bean Soup (Dhyd)	8 lbs.
(2) 1 Package	Potatoes (Dhyd)	8 lbs.
(3) 1 Package	Rice	7 lbs.
(4) 1 Can	Bacon	5 lbs.
(5) 1 Box	Tea (bags)	1 lb.
(6) 1 Package	Sugar	2 lbs.
(7) 1 Package	Salt	1 lb.
(8) 1 Package	Raisins	5 lbs.
(9) 2 Boxes	Bouillon Cubes (20 cubes per box)	6-1/2 ozs.
(10) 2 Boxes	C-Biscuit Ration	2 lbs. 7 ozs.
(11) 10 Cans	Pemmican (12 oz. net per can)	7-1/2 lbs.

- t. One (1) each, Fishing Kit (in cardboard container), including:

- (1) 50 ft. Fishing Line.
- (2) One (1) each Tin, Assorted Fishing Hooks.



- (3) Two (2) each, Gut Leaders.
- (4) Five (5) each, Sinkers, Lead.
- (5) One (1) each, Box, Assorted Flies.
- (6) One (1) each, Daredevil Lure, or equal.
- (7) One (1) each, Jar Salmon Eggs.
- u. Three (3) each, Candles, Wax 8" x 3/4".
- v. One (1) pair, Snowshoes, trail-breaking (winter only).
- w. Ten (10) each, Headnets, Mosquito (summer only).
- x. One (1) each, Mirror, emergency signalling spec. 40652, Class 03F, Stock No. 4500-580650.

2. The following is a list of the contents of a kit to be used on C-64, AT-7, and C-45 type aircraft:

- a. One (1) each, Canteen and Cup.
- b. One (1) each, Mess Kit, complete with knife, fork and spoon.
- c. One (1) pair, Snow Goggles.
- d. Emergency Food:

<u>Quantity</u>	<u>Item</u>	<u>Amount</u>
(1) 1 Package	Green Pea, Yellow Pea Navy Bean Soup (Dhyd)	6 lbs.
(2) 1 Package	Potatoes (Dhyd)	6 lbs.
(3) 1 Package	Rice	6 lbs.
(4) 1 Can	Bacon	4 lbs.
(5) 1 Box	Tea Bags	1 lb.
(6) 1 Package	Sugar	2 lbs.

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(7)	1 Package	Salt	1 lb.
(8)	1 Package	Raisins	3 lbs.
(9)	2 Boxes	Bouillon Cubes (20 cubes per box).	6-1/2 ozs.
(10)	2 Boxes	C-Biscuit Ration	2 lbs. 7 ozs
(11)	2 Cans	Pemmican (12 oz. net per can)	7-1/2 lbs.

e. One (1) Fishing Kit in Cardboard Container, including:

- (1) 50 ft. Fishing Line.
- (2) One (1) each, Tin, Assorted Fishing Hooks.
- (3) Two (2) each, Gut Leaders.
- (4) Five (5) each, Sinkers, Lead.
- (5) One (1) each, Box, Assorted Flies.
- (6) One (1) each, Daredevil Lure, or equal.
- (7) One (1) each, Jar, Salmon Eggs.
- f. One (1) each, Flashlight.
- g. Four (4) each, Batteries, Flashlight.
- h. One (1) each, Knife, Hunting, 6 inch blade.
- i. One (1) each, Compass, Pocket.
- j. One (1) each, Marble Gamegetter, Over-under gun, .410 gauge and 22 caliber.
- k. 25 Rounds .410 Ammunition, Number 6 Chilled Shot.
- l. 25 Rounds .410 Ammunition, Slug Load.
- m. 50 Rounds Ammunition, Ball, Caliber 22, long rifle.

- n. Four (4) each, Headnets, Mosquito (summer only).
- o. Two (2) each, Match Cases, Waterproof (with matches, kitchen wood).
- p. One (1) each, Shovel, Short Handle.
- q. Two (2) each, Candles, Wax, 8" x 3/4".
- r. Two (2) each, Starter Fire MI.
- s. One (1) pair, Snowshoes, trail-breaking (winter only).
- t. One (1) each, Axe, Hudson Bay Type, or equal.
- u. One (1) each, File (6") flat mill bastard, 6" Class 7900, Stock No. 297100.
- v. One (1) each, Mirror, Emergency signalling Spec. 40652, Class 03F, Stock No. 4500-580650.

NOTE: Contents of this kit will be encased in a waterproof canvas bag.

3. The shovel, axe, and snowshoes will be tied to the outside of the kit. The file will be fastened to the axe handle three (3) inches from the head with friction tape, tang of file toward bottom of handle.

4. The Flight Emergencies Officer will be responsible for the completeness of these kits, and will make a monthly inspection of its condition. A number will be assigned to each kit, and a record kept of its location.

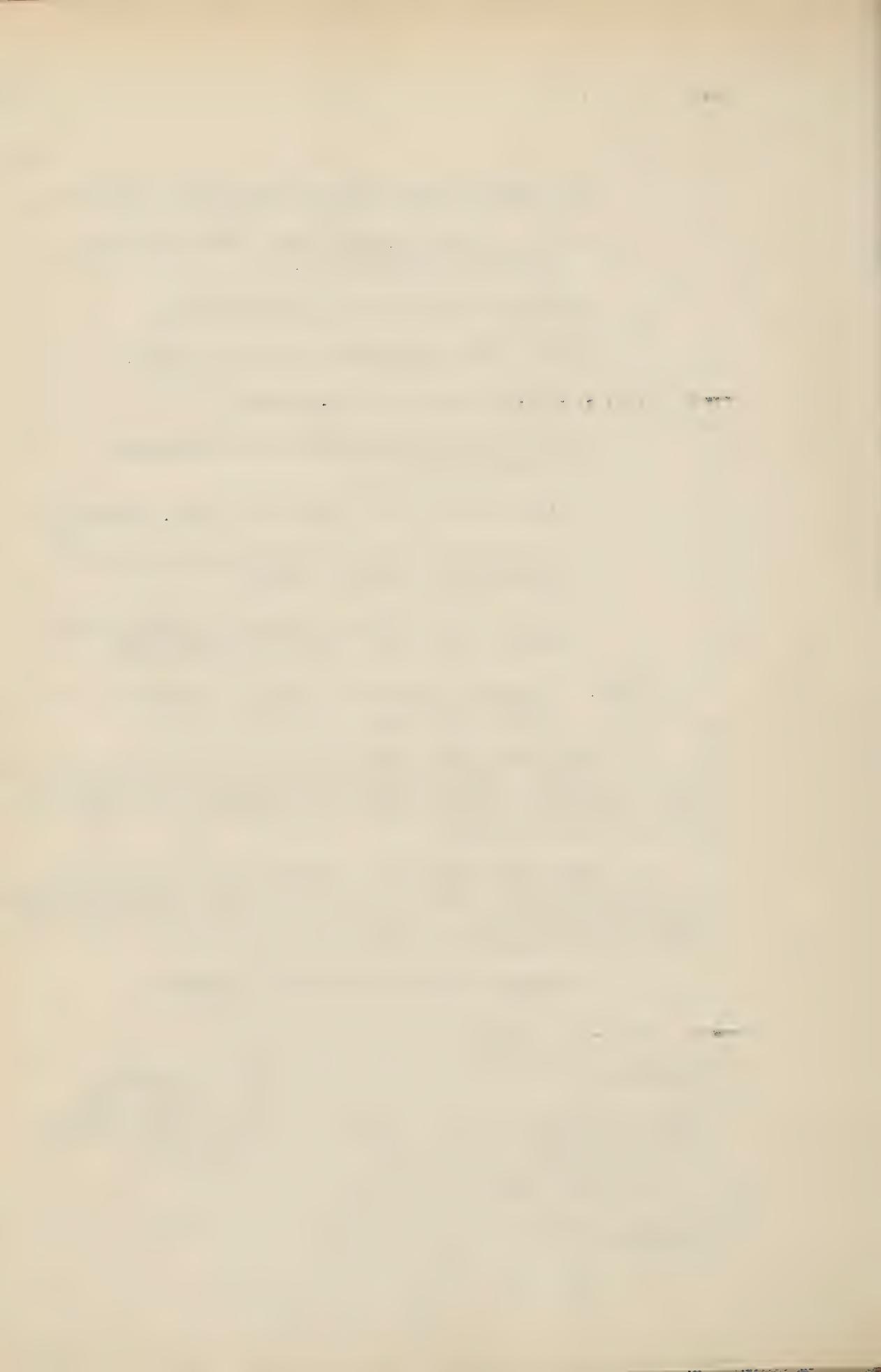
BY COMMAND OF BRIGADIER GENERAL GAFFNEY:

OFFICIAL:

/s/ R. P. Wilson
 R. P. WILSON
 Lt. Col., AC,
 Actg. Adj. Gen.

PAUL E. GREINER,
 Lt. Colonel, GSC
 Asst. Chief of Staff,
 Operations

CONTRIBUTION "C"



72ND Rcn Sq (VLR) PHOTOGRAPHIC
 Office of the Personal Equipment Officer
 APO 731, C/o Postmaster
 Seattle, Washington

13 January 1949

SUBJECT: PERSONAL AND EMERGENCY EQUIPMENT

1. The following list of equipment, personal and emergency to be carried on all flights by the 72nd Rcn Sq (VLR) Photographic, is necessary to the minimum safety of all crew members.

A. These items will be carried on all flights by personnel.

(1)	Glasses, flying sun, rose smoke	1 pr.
(2)	Gloves, flying type B-3	1 pr.
(7)	Gloves, flying winter, type D-3A	1 pr.
(4)	Goggle assembly, flying type B-8	1 pr.
(5)	Helmet, flying intermediate, type A-11	1 ea.
(6)	Insert, rayon	2 pr.
(7)	Jacket, flying type B-15	1 ea.
(8)	Bag, aviators kit	1 ea.
(9)	Mask, oxygen type A-14	1 ea.
(10)	Shoes, flying type A-6A	1 pr.
(11)	Suit flying summer, wool gab.	2 ea.
(12)	Suit, flying summer very light	1 ea.
(13)	Vest, emergency subsistance	1 ea.

CONTAINING

- a. Water-proof match box with compass and flint
- b. 14 fire starting tabs
- c. Fishing-sewing kit in plastic container
- d. 20 shot-cartridge .45 cal.
- e. Waterproof cover for, .45 cal. pistol
- f. Collapsible spit and gaff
- g. 2 parachute rations in tin cans
- h. Plastic water canteen
- i. Safety razor and blades
- j. Hat with adjustable band reversible yellow and green
- k. Gloves with woolen liner
- l. Polaroid sun goggles green folding type
- m. Mosquito head net

BASIC: Ltr., Subj: Personal and Emergency Equipment, dtd.,
13 Jan 49

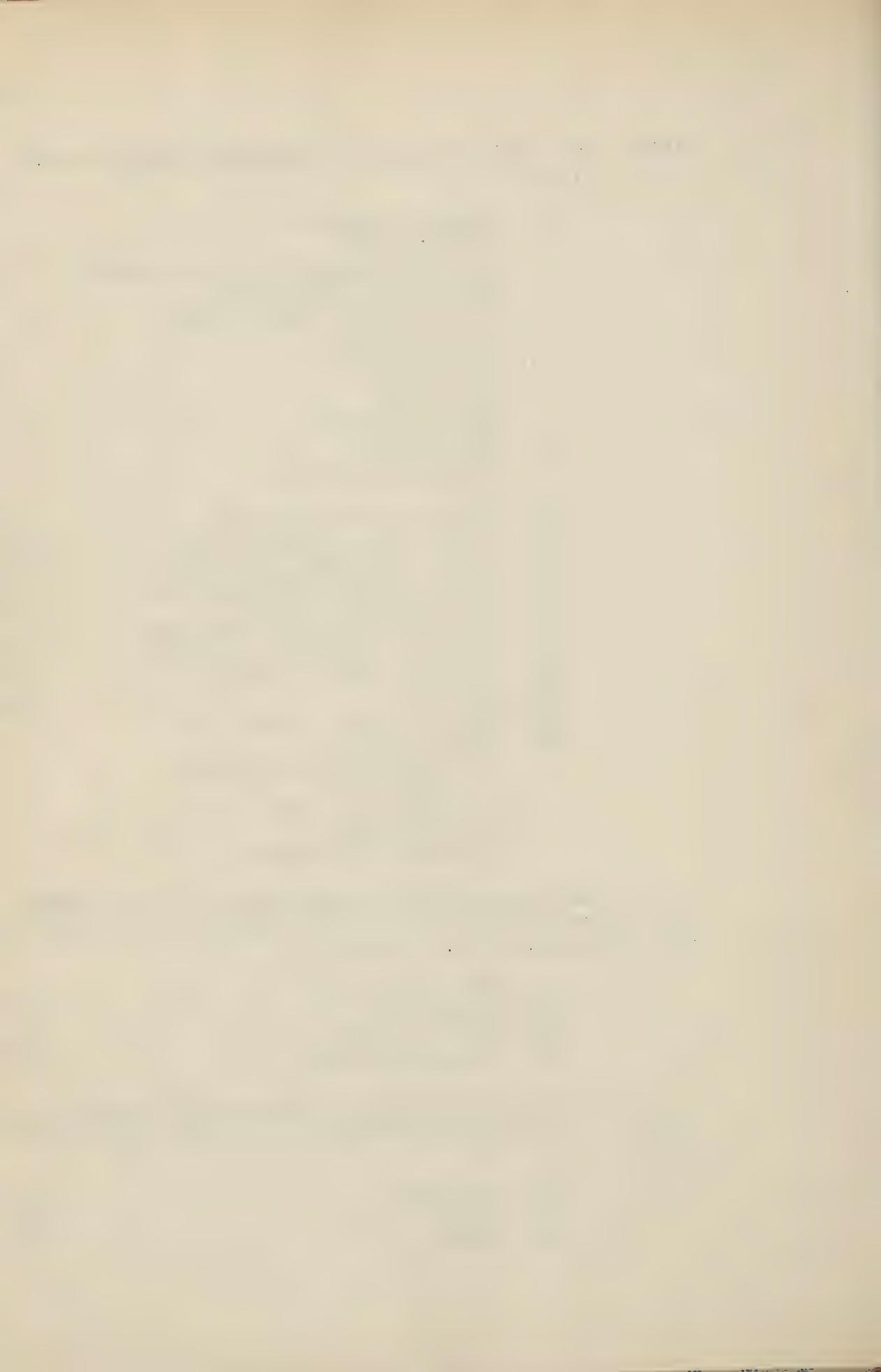
n.	Mosquito repellent	
o.	First aid kit	
p.	Ten yards bandage (with sulfa powder)	
q.	Signal mirror with lanyard	
r.	Two five minute signal flares	
s.	Signal whistle	
t.	Survival manual	
u.	Scout knife	
v.	Large knife	
w.	Sharpening stone	
x.	Oil container	
y.	Package toilet tissue	
(14)	Gloves electric type F-3A	1 pr.
(15)	Gloves flying winter type A-9	1 pr.
(16)	Jacket, electrical type F-3A	1 ea.
(17)	Jacket, winter flying type B-11	1 ea.
(18)	Shoe electrical type Q-1	1 pr.
(19)	Trousers, flying type winter AllA	1 pr.
(20)	Trousers, electrical type F-33A	1 pr.
(21)	Boots felt type F-2 or F-3	1 pr.
(22)	Mask face	1 ea.
(23)	Shoes, muckluk, type A-14 or	
(24)	Insert, muckluk	
	1 pr intermediate wool socks	
	1 pr light socks	
	1 pr heavy wool socks	
	1 pr felt boots	
	1 pr felt soles (inserts)	

2. In accordance with AAC Regulation 60-1, crew members are required to carry the following equipment. The balance of 60-1 is carried in Par. 1 above.

(1)	Undershirts, wool	2 pr.
(2)	Drawers, wool	2 pr.
(3)	Shirt, wool OD	1 ea.
(4)	Trousers, wool OD	1 ea.

3. The following items are recommended by personal equipment to be carried in the pockets of the flying suit, as extra items.

(1)	Socks, wool	1 pr.
(2)	Gloves	1 pr.
(3)	Candles	2 ea.



BASIC: Ltr., Subj: Personal and Emergency Equipment, dtd.,
13 Jan 49

- (4) Matches
- (5) Wire for snares
- (6) Sun goggles
- (7) Chap stick
- (8) Hunting knife
- (9) Charm candy
- (10) Pistol and ammo
- (11) Signal panel instruction sheet.

4. The following items are issued to each crew member prior to take-off.

- (1) 1 ea. Parachute
- (2) Anti-exposure suit
- (3) Preserver. Pneumatic life vest. (when over water)

5. The following items are issued to each aircraft prior to take-off.

- (1) 2 ea. carbines, 120 rounds, 8 clips
- (2) 2 pr. binoculars
- (3) 6 pr. snow shoes
- (4) 100 rds. .45 cal. ammunition
- (5) 1 ea. first aid kit (ARCTIC)
- (6) 3 ea. first aid kit aeronautical

6. The following equipment is to be found on each aircraft of this squadron, as minimum distribution:

(1)	Mattresses, air pneumatic, A-3	16 ea.
(2)	Bag, sleeping, A-3 or Quartermaster	16 ea.
(3)	Kit, emergency subsistence F-14	1 ea.
(4)	Kit, aerial delivery rations replenishing F-1	1 ea.
(5)	Radar reflectors	4 ea.
(6)	Pyrotechnic pistol	1 ea.
(7)	Smoke grenades	6 ea.
(8)	Pyrotechnics Parachute type	24 ea.
	Two star type	12 ea.
(9)	Life rafts, F-2's	2 ea.
(10)	Axe, Long handle	1 ea.
(11)	Axe, crash short handle	1 ea.
(12)	K Rations	4 Cases
(13)	Shovel, short handle	1 ea.

BASIC: Ltr., Subj: Personal and Emergency Equipment, dtd.,
13 Jan 49

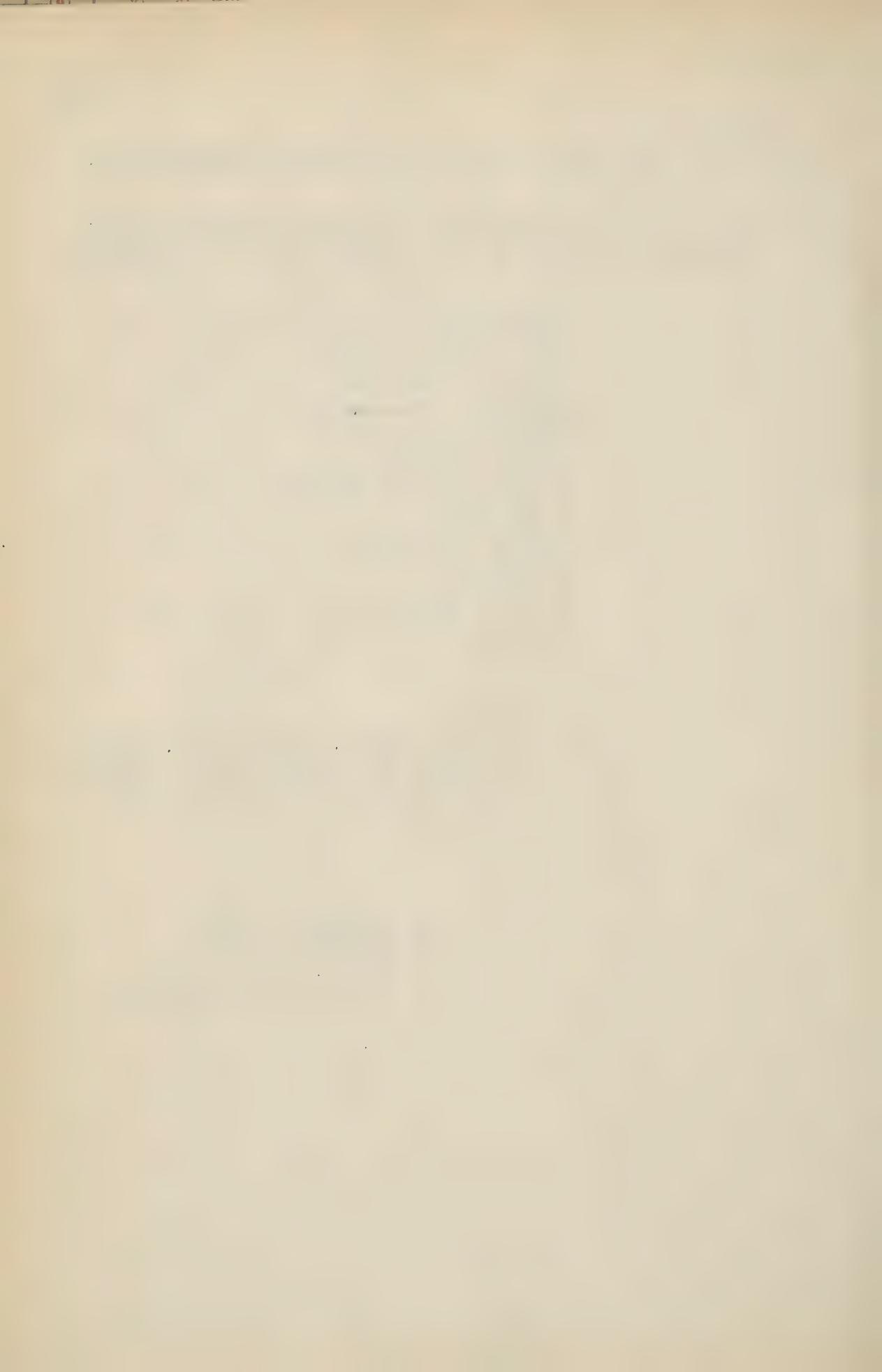
7. The following listed items are contained in the one man polar drop kit. This experimental kit will be dropped to survivors, 1 per man in case of emergency.

Bag sleeping, Quartermaster
Wind-Breaker, Parka
Wind-Breaker, Trouzers
Underwear, Wool Shirt
Underwear, Wool Drawers
Muckluks, with Inserts
3 pair of gloves
20 cans parachute Rations
1 Stove, Pans and Utensils
1 M-1 Carbine
4 Boxes Ammunition
Bear Paw Snow Shoes
1 Tarpaulin
1 Can of Gasoline
6 Day and Night Flares
1 Ice Saw

Accessories:

Glasses, Mirror, First Aid Kit, Sun Burn Ointment, Fishing Kit, Candles, Instruction Book, File, Saw Blade, Spit and Graft Assy: Matches.

s/ Frederick J. Wack
t/ FREDERICK J. WACK
1st Lt. USAF
Personal Equipment Officer



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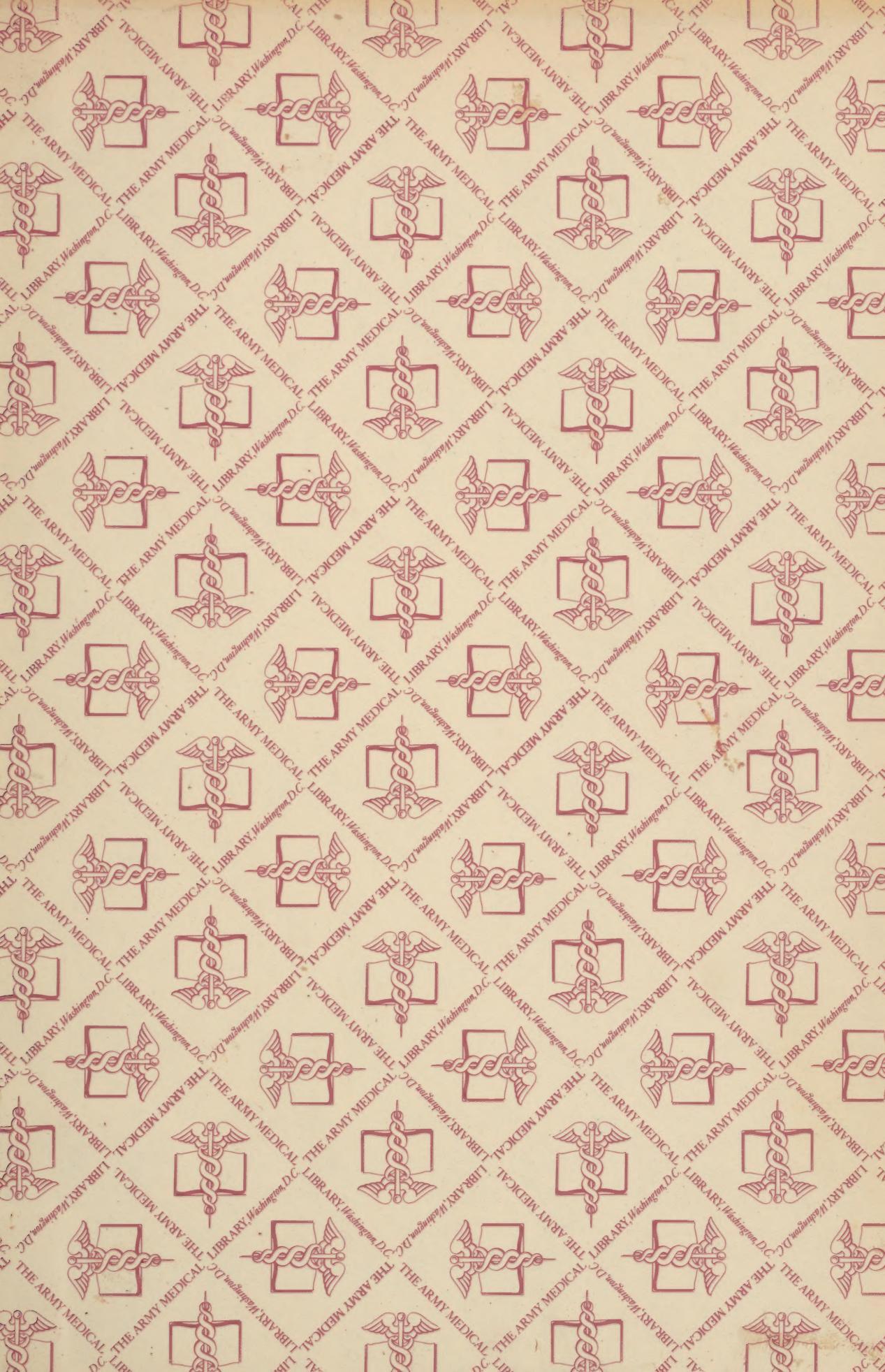
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